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ABSTRACT

This is the second report providing information on the nature and extent of local government participation in research and development activities. Data from fiscal years 1968 and 1969 are compared with data from the earlier report which covered 1966 and 1967. The report presents the data by functional area (health, sanitation, education, police, etc.), fields of science involved, personnel to whom work is assigned, character of work (basic or applied research or development), and source of funds expended. The appendices contain technical notes relating to the survey, statistical tables, tables of academic R&D activities sponsored by local governments, and the survey questionnaire. (JS)

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Research and Development in Local Governments

Fiscal years 1968 & 1969

HE 002

Surveys of Science Resources Series

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Foreword

THIS IS THE SECOND REPORT providing information and data on the nature and extent of local government participation in research and development. Fiscal years 1968 and 1969 are covered and compared with data from the earlier survey and report which covered fiscal years 1966 and 1967. This report is one in a series of NSF studies and surveys on the scientific resources and activities of the various sectors in the Nation's economy—government (Federal, State, and local), industry, universities and colleges, and nonprofit institutions.

The report was prepared in the Foundation's Office of Economic and Manpower Studies, Thomas J. Mills, Head. General guidance for the study was provided by Kenneth Sanow, Head, Statistical Surveys and Reports Section. Data collection and tabulations were carried out by the Bureau of the Census under the general direction of David P. McNelis, Chief, Governments Division.

The National Science Foundation and the Bureau of the Census gratefully acknowledge the help and cooperation of the many officials in the local governments who provided the data on which this report is based.

CHARLES E. FALK
Director, Division of Science
Resources and Policy Studies

JANUARY 1971

4

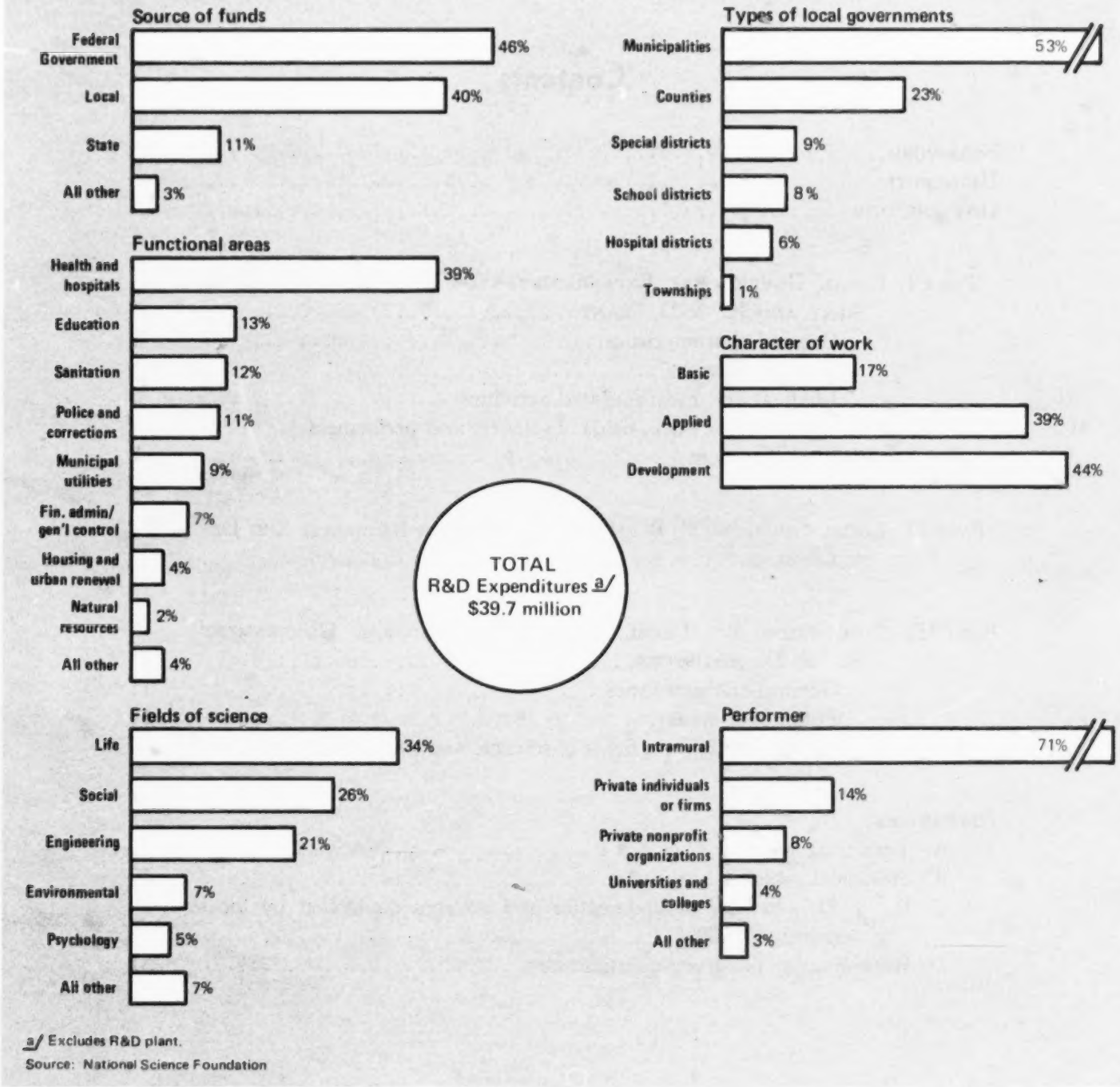
Acknowledgments

This report was prepared under the direction of Benjamin L. Olsen, Study Director, Government Studies Group. Wayne Zajac had major staff responsibility for planning, developing, and writing the report. Within the Bureau of the Census, data collection and tabulation were carried out under the direction of Joan Yarbrough, Chief, Special Projects Branch, Governments Division, assisted by Donna Madigan and Frank Perry.

Contents

	Page
FOREWORD	iii
HIGHLIGHTS	vii
INTRODUCTION	ix
PART I. LOCAL GOVERNMENT EXPENDITURES FOR RESEARCH, DEVELOPMENT AND R. & D. PLANT	1
General characteristics	1
Functional areas	3
Medical and health-related activities	6
Character of work, fields of science, and performers	7
R. & D. plant	8
PART II. LOCAL GOVERNMENT PERSONNEL ENGAGED IN RESEARCH AND DEVELOPMENT	9
PART III. COMPARISON OF LOCAL, STATE, AND FEDERAL GOVERNMENT R. & D. ACTIVITIES	11
General characteristics	11
Functional areas	11
Character of work, fields of science, and performers	12
APPENDIXES:	
A. Technical notes	15
B. Statistical tables	19
C. R. & D. activities of universities and colleges controlled by local governments, 1968	47
D. Reproduction of survey questionnaire	51

Distribution of local government R&D expenditures, by major characteristics, FY 1969



a/ Excludes R&D plant.

Source: National Science Foundation

HIGHLIGHTS

- Local government R. & D. expenditures nearly doubled between 1966 and 1969, from $20 million to $40 million (p. 1 for details).[1]

- Approximately one-half of the funds spent by local governments for research and development were provided by the Federal Government (facing chart and p. 1).

- Municipalities accounted for the greatest portion of local government R. & D. expenditures (facing chart and pp. 1–2).

- The largest area of local government R. & D. activity was health and hospitals, followed by education (facing chart and pp. 3–6).

- Increased emphasis was placed on developmental work in 1969 compared to 1966 (facing chart and p. 7).

- The life, social, and engineering sciences were the largest fields involved in local government R. & D. activity (facing chart and pp. 7–8).

- Local governments perform most of their R. & D. work themselves (facing chart and p. 8).

- Approximately 2,600 full-time-equivalent personnel were performing R. & D. work for local governments in 1969 (p. 9).

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[1] The R. & D. activities of universities and colleges controlled by local governments are not included in this report since they are covered in another NSF report, *Resources for Scientific Activities at Universities and Colleges, 1969* (NSF 70–16). A brief summary of the scientific activities conducted at these local institutions is presented in app. C. of this report. These institutions expended $28 million for R. & D. purposes in 1968.

Introduction

LOCAL GOVERNMENTS have been receiving increasing attention in recent years as the problems of modern society—poverty, crime, inadequate education, pollution, to mention a few—become more pronounced. This report shows to what extent and in which areas local governments are involved in research and development in their efforts to provide new techniques, methods, and equipment to alleviate some of these conditions.

Local government expenditures for R. & D. purposes are small, but nonetheless significant, in some areas—such as health and hospitals—and the level of R. & D. expenditures has shown a large increase (nearly 100 percent in 4 years). Moreover, large increases have occurred in two of the generally recognized critical problem areas—police protection and correction, and sanitation.

Local governments are not, of course, alone in their efforts to find solutions to some of the foregoing problems. State government agencies, Federal Government agencies, industrial firms, and universities and colleges are all involved in R. & D. activities, which relate directly to areas of interest to local governments. Even though the vast majority of its R. & D. outlays goes for areas outside the responsibilities of local governments, the Federal Government predominates in terms of R. & D. funding support in these local areas.

More important than the level of local R. & D. expenditures is the value or benefit received from the application of the results of research and development regardless of where the research and development is performed. For local governments, utilization of the findings of research and development has come from their own R. & D. work to some extent, but far more extensively from the R. & D. efforts of the other sectors.

Furthermore, in recent years, local governments and others have taken a number of steps to increase this utilization of the results of science and technology. The establishment of science advisory organizations within New York City, Chicago, Los Angeles, Seattle, and other cities is one way that local governments are seeking to utilize scientific and technological knowledge more effectively. Local governments operate these advisory organizations in addition to directly conducting and sponsoring R. & D. projects. Examples of the Federal Government's activities along these lines are the recently established programs of the National Science Foundation and National Aeronautics and Space Administration to help promote the use of scientific and technological advice for solution to urban problems: NSF's Intergovernmental Science Program and NASA's Urban Technology Utilization Program.

This report presents data on the R. & D. expenditures of local governments by functional area, the fields of science involved, the performers to whom R. & D.

work is assigned, the character of work—basic research, applied research, or development—and the source of the R. & D. funds expended. Major data characteristics are also shown for the years covered by the first report on local governments.

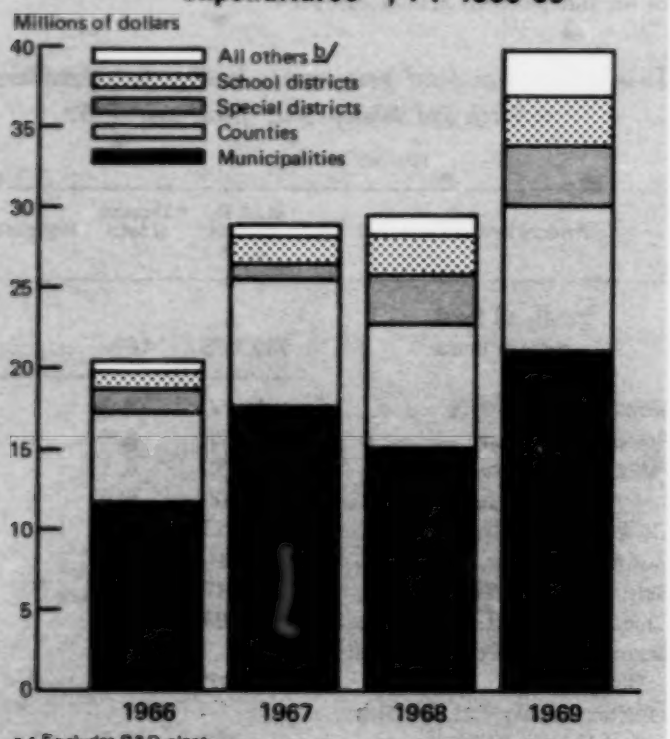
Thus, the report provides an overall view of the R. & D. efforts and activities of local governments over a 4-year period (1966–69) and describes the relationships to the other R. & D. sectors. This information can serve as a starting point for further study and analysis of local government involvement, participation, and use of science and technology.

PART I. Local Government Expenditures for Research, Development, and R. & D. Plant

General characteristics

Local government expenditures for research and development totaled $29 million in fiscal year 1968 and $40 million in fiscal year 1969. An additional $2 million in 1968 and $7 million in 1969 were spent for R. & D. plant (land, buildings, and fixed equipment) which supports the research and development conducted. In 1966, the first year such data were collected, local government expenditures for research and development totaled $20 million (chart 1).

Chart 1. Local government R&D expenditures [a], FY 1966-69



[a] Excludes R&D plant.
[b] Hospital districts and townships.
NOTE: Detail may not add to totals because of rounding.
Source: National Science Foundation

Even with this large increase, however, local government R. & D. activity remains at a low level when compared to total local government expenditures and to the R. & D. activity of State government agencies and the R. & D. activity of the Federal Government. In 1969, R. & D. expenditures constituted less than one-tenth of 1 percent of total local government expenditures for all purposes. There were no significant differences in this ratio among the different types of local governments. By comparison, in 1968 State government agencies, with approximately the same level of total expenditures nationwide had R. & D. expenditures five times as great as those of local governments. The gap is even wider at the Federal level where approximately 9 percent of total Federal expenditures goes for R. & D. purposes.

Agencies of the Federal Government play a key role in the level, extent, and nature of the R. & D. activity conducted by local governments. The financial impact is very great; in 1969, Federal agencies financed 46 percent of local government R. & D. expenditures, compared to 40 percent financed by the local governments themselves, 11 percent by State governments, and 3 percent by other sources. In 1966 the Federal proportion was even higher (55 percent). The real impact is even greater, however, due to the matching fund requirements of many Federal programs.

The local governments included in this report are of six types: municipalities, counties, special districts (such as water and sewer districts, sanitation districts, or other single-function districts), school districts,[1] hospital districts, and townships. Municipalities and counties dominated local government

[1] Independent school districts. School systems that were integral parts of municipal or county governments are included with their parent unit.

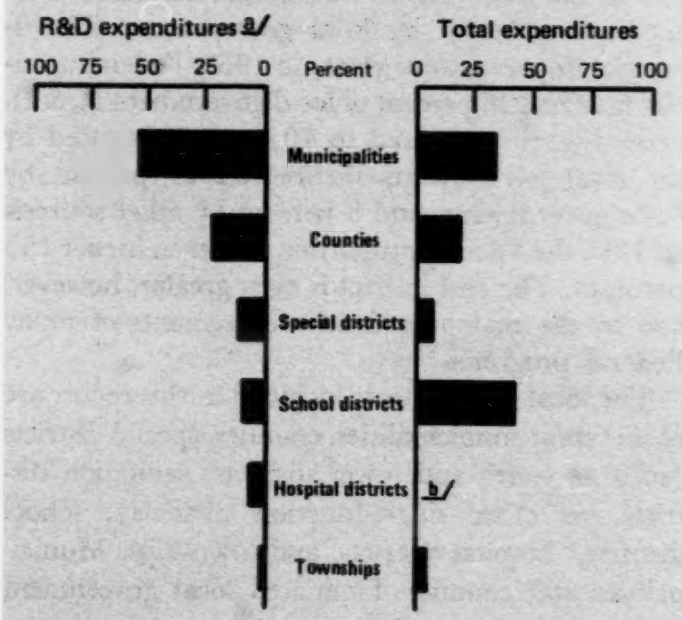
R. & D. activity and accounted for three-fourths of the total R. & D. activity in 1969 (chart 2). This pattern has changed little since 1966 except that municipalities and counties represented nearly 85 percent of the total in that year while hospital districts were much smaller. This situation differs considerably from the total funding support levels of local governments where school districts received the largest share of funding support, 39 percent, but only represented 8 percent of the R. & D. total.

Institutions of higher education—universities, colleges, junior and community colleges—controlled by local governments were excluded from the survey since these institutions are included in another series of studies by NSF. These local institutions had R. & D. expenditures of $28 million in 1968 but only a nominal share (less than $1 million) of these expenditures was supplied by local governments; this share is also reported in this survey. A large share of the R. & D. activity of these institutions represents work done in only a few institutions, generally medical schools. A summary of the R. & D. activity of local universities and colleges is presented in appendix C.

R. & D. activity is heavily concentrated among a relatively small number of local governments. In 1969, 147 local governments reported expenditures for research and development and of these, the leading 50 represented 88 percent of the total; the first 10, 53 percent, and the first five, 38 percent. Of the 10 leading local governments, six, including the first three, were municipalities, two were counties, and two were hospital districts (ninth and 10th rankings). Seven of the 10 local governments leading in level of R. & D. expenditures in 1969 were also among the leading 10 in 1966 although in somewhat different order (table 1). Of the remaining local governments reporting R. & D. expenditures in 1969, four had expenditures between $500,000 to $800,000; 53 between $100,000 to $500,000; and 80 under $100,000. New York City reported more expenditures for research and development than any other local government in all 4 years 1966–69 and more than twice as much as the next largest local government in 1969.[2]

Local government R. & D. expenditures are shown by State distribution in chart 3. The five States leading in local government R. & D. activity

Chart 2. **Comparison of R&D expenditures with total expenditures, by local governments, FY 1969**



a/ Excludes R&D plant.

b/ Included in special districts. Separate date not available.

Sources: National Science Foundation and Bureau of the Census.

[2] A number of reasons exist for differences between seemingly similar types of local governments. These include: geographic size, organization, and functional responsibility. The latter is of particular importance; for example, education is considered to be a function of the government of New York City but not of Los Angeles City where it is a responsibility of an independent school district.

TABLE 1.—*Ten local governments leading in expenditures for research and development,[1] fiscal year 1969*

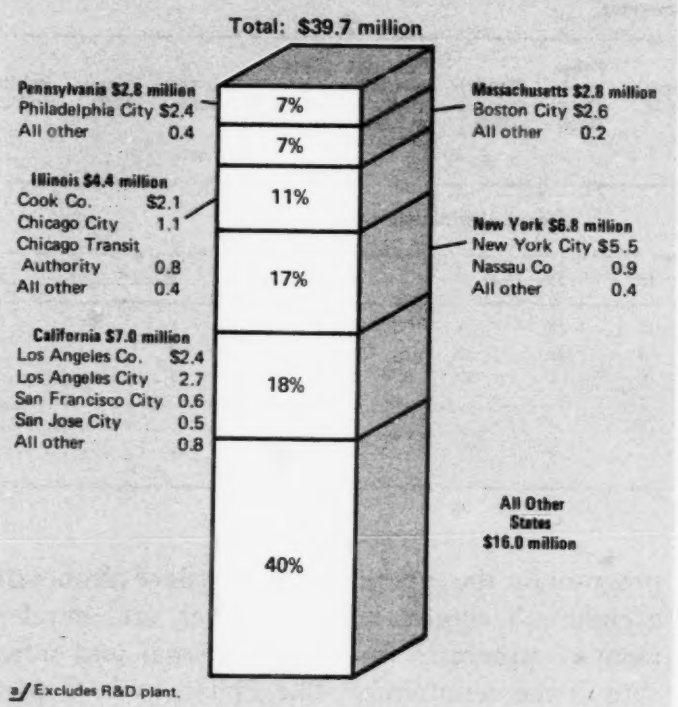
[Dollars in thousands]

Individual local government	R. & D. expenditures	Percent of total	1966 rank
Total, all local governments	$39,688	100	.....
New York City, N.Y	5,450	13.7	1
Boston City, Mass	2,628	6.6	6
Philadelphia City, Pa	2,432	6.1	3
Los Angeles County, Calif	2,400	6.0	2
Cook County, Ill	2,055	5.2	5
Los Angeles City, Calif	1,718	4.3	7
Baltimore City, Md	1,147	2.9	(2)
Chicago City, Ill	1,103	2.8	9
Bexar County, Tex., Hospital District	1,094	2.8	(2)
Marion County Ind., Health and Hospital District	869	2.2	(2)
All others	18,792	47.3	NA

[1] Excludes R. & D. plant.

[2] Not among leading local governments in 1966.

Chart 3. **Local government R&D expenditures[a/], by State, FY 1969**



a/ Excludes R&D plant.

Source: National Science Foundation

represent about 60 percent of the total. Of these five, only California and Illinois contained more than one local government reporting significant R. & D. expenditures. There were 10 States in 1969 where no local governments reported expenditures for research and development and six States which were not surveyed because no local governments met the size criteria for inclusion in the survey sample (technical notes).

A number of factors influence the level of R. & D. spending by individual local governments. Of the eight largest local governments in terms of R. & D. expenditures in 1969, all are among the most populous cities or counties. Population, of course, affects and parallels other economic variables such as employment, income, and direct expenditures. On a per capita basis, however, there is little correlation between these measures and level of R. & D. expenditures. Other factors would include the education, background, and experiences of local officials, which influences their attitude toward science and technology in general and toward research and development in particular. The ability of local officials to attract outside financial support (especially Federal funds) for specific projects must also be considered an important factor since about one-half of total local R. & D. expenditures are funded from other than local government sources. Furthermore, the nature and extent of scientific activity by the other R. & D. performers within the locale—for example, universities, industry, and nonprofit organizations—undoubtedly affects the activity conducted and sponsored by the local governments themselves.

In contrast to the above, there are a number of negative influences affecting the level of R. & D. activity by local governments. These include inadequate financial resources, lack of qualified scientific personnel, legal restrictions, resistance of departmental personnel, and absence of support from elected officials.[3]

Functional areas

The R. & D. projects of the responding local governments were classified into functional areas to gage the directions of effort of local government R. & D. activity. Ten functions plus an "all other" category were used by the Bureau of the Census and the National Science Foundation in classifying the projects on the basis of reported descriptions from the respondents and on information from other sources.

Overall, local government R. & D. expenditures were heavily concentrated in a few areas—health and hospitals, education, sanitation, and police and corrections (chart 4). In 1969, these four areas represented 76 percent of the total with health and hospitals alone nearly 40 percent and the other three, 13 percent, 12 percent, and 11 percent, respectively. This pattern shows a shift in local R. & D. functional emphasis since 1966. In that year, health and hospitals accounted for 55 percent of the total and education 10 percent, while the areas of sanitation and police and corrections were each less than 4 percent of the total. Thus, between 1966 and 1969, local government R. & D. activity has shifted from a very substantial emphasis on health and hospital and educational research and development to activity involving increased emphasis in two additional areas—sanitation and police and corrections.

There are a number of differences in functional area distribution patterns among the six types of local governments as shown in table 2. Municipalities and counties are engaged in R. & D. activities involving many functional areas whereas special districts, school districts, and hospital districts concentrate their R. & D. activities primarily in only one or two

[3] "Science-Technology Advice in Local Governments, International City Management Association," *Urban Data Service,* November 1970, vol. 2, No. 11, p. 21.

TABLE 2.—*Local government expenditures for research and development, by type of local government and functional area, fiscal year 1969*

[Dollars in thousands]

Type of local government	Total R&D expenditures	Total	Health and hospitals	Education	Sanitation	Police and corrections	Municipal utilities	Financial administration and general control	Housing and urban renewal	Natural resources	Highways	Public welfare
		Percent distribution										
Total	$39,688	100	39	13	12	11	9	7	4	2	(1)	(1)
Municipalities	20,963	100	37	4	17	16	5	10	5	1	1	
Counties	9,073	100	56	11	3	10	4	5	5	2		1
Special districts	3,603	100	5		26	5	51	3	1	5		
School districts	3,219	100		100								
Hospital districts	2,424	100	100									
Townships	407	100	6			3	22		29	24	1	

[1] Less than 0.5 percent.

areas. These districts are generally single-purpose, and thus their R. & D. activity is generally directly relatable to that single purpose. For example, hospital districts and school districts expended their R. & D. funds only for the functional areas of health and hospitals and education, respectively. The special districts in this report included water districts, sanitation and sewer districts, housing authorities, and transportation districts. As table 2 shows the functional distribution of these R. & D. expenditures reflects their primary purpose.

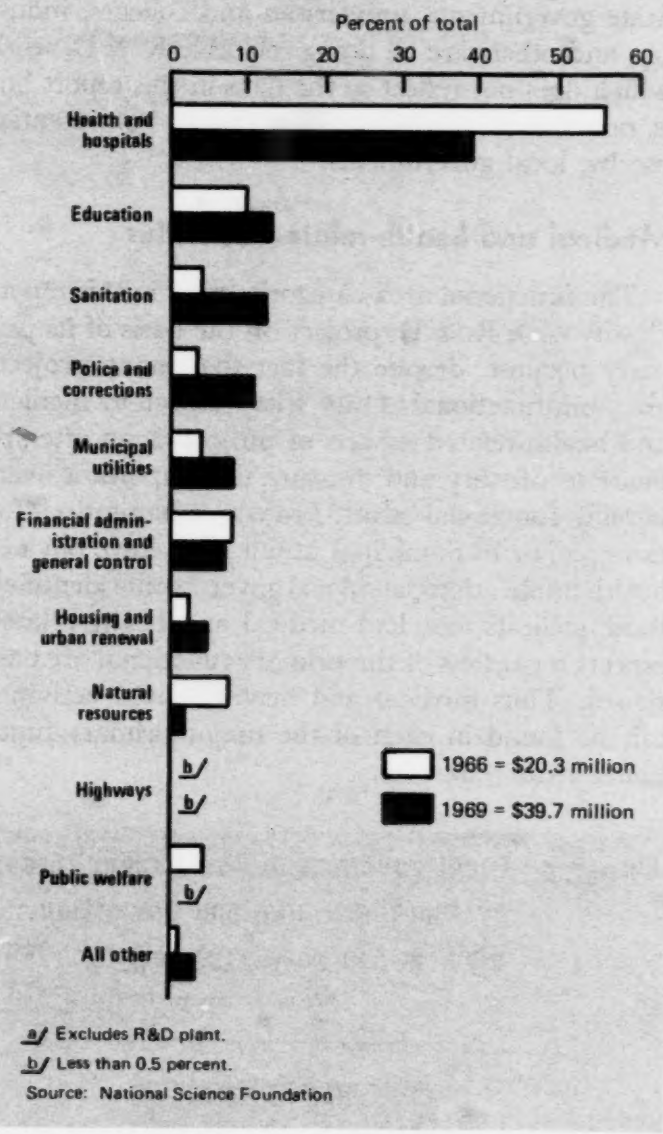
Although the area of health and hospitals showed a relative decrease in share of total local government R. & D. expenditures from 1966 to 1969, it was still considerably larger than any other function. R. & D. expenditures in this area rose approximately 40 percent from 1966 to 1969 compared to the overall increase of 100 percent for all local government R. & D. expenditures.

One-half of total local R. & D. expenditures in the health and hospital area in 1969 represented activity by two municipal hospitals, Philadelphia and Boston, one county hospital, Cook County, Ill., and one hospital district, Bexar County, Tex. The activity conducted by these units was essentially biological and disease-oriented although some projects dealt with new methods of providing health services. R. & D. activity at the Boston City Hospital, for example, included projects such as blood clotting in cardiovascular disease, the effect of aging on red cell membranes, the usefulness of EMG in monitoring digitalis therapy, and determinants of myocardial performance. Other projects having more social aspects and implications in health care included a program for the experimental analysis of alcoholism, a children's clinical research center, and development of programs involving maternal and infant care in the community. The Philadelphia General Hospital reported similar projects, and also projects in the area of mental health, including the psychopathology of depression and suicide, and group psychotherapy for character disorder. The Bexar County (Tex.) Hospital District reported R. & D. expenditures for projects concerning detection of cervical cancer and for development of community mental health services.

The projects described above are representative of the types of R. & D. projects conducted by the hospitals and health departments of the municipalities, counties, and hospital districts reporting R. & D. expenditures. Some 48 percent of the total local R. & D. expenditures in this area was financed by the Federal Government. The overwhelming bulk of the Federal share was provided through programs of the National Institutes of Health and National Institute of Mental Health although there were several projects financed from other agencies such as the National Aeronautics and Space Administration and the Department of the Army.

The second largest area of local government R. & D. activity was education. Local R. & D. expenditures in this area increased 2½ times from the 1966 level of $2 million. Over 60 percent of the total local R. & D. expenditures in the education area represented work by independent school districts, the remainder represented work by public school systems that are dependent agencies of municipal and county governments.

Chart 4. **Local government R&D expenditures[a/], by functional area, FY 1966 and 1969**



a/ Excludes R&D plant.
b/ Less than 0.5 percent.
Source: National Science Foundation

Local government educational R. & D. projects consisted of many different subject areas, among which development of new and improved curriculums was one major activity. The Broward County (Fla.) Board of Public Instruction reported projects to develop new curriculums in the areas of science, mathematics, vocational subjects, and guidance. Anne Arundel County (Md.) reported expenditures for a multimedia project which seeks to develop course models in the areas of chemistry, preliminary French, and geometry. The objective is to obtain insights in approaches to the development of curriculums and how best to utilize new educational tools such as audio and video tapes, and computerized individual instructional programs. Other projects of school systems involved studies of the effects of various educational programs. The Fremont (Calif.) Unified School District conducted a study to determine the effects of individualized instruction on subject matter achievement and personality, and the Racine (Wis.) United School District studied the longitudinal effects of the Headstart Program.

In 1969, 70 percent of local government R. & D. projects in the area of education were financed by the Federal Government's Office of Education (OE). Some of these projects were sponsored and financed by OE's Bureau of Research while others were funded through the various titles of the Elementary and Secondary Education Act of 1965 which furnishes approximately $1 billion annually to State and local governments for educational purposes.

The area of sanitation was the third largest functional area. This area includes both solid-waste disposal and sewage treatment activities. In 1966, local R. & D. expenditures in this area were less than $1 million but rose to approximately $5 million in 1969, more than a sixfold increase in 4 years. This increase reflects, in part, the increased attention being focused on pollution, ecology, and the environment.

Five local governments—New York City, the Metropolitan Sanitary District of Greater Chicago, Los Angeles County, San Francisco City, and Detroit City—accounted for 70 percent of the total local R. & D. expenditures in the sanitation area in 1969; New York City alone represented nearly 40 percent of the total; the other four governments represented between 7 percent and 10 percent each.

New York City's Department of Sanitation, part of the city's Environmental Protection Administration, expended R. & D. funds to study various methods of improving solid-waste disposal processes. Methods studied included containerization to eliminate manual handling, and the design of buildings to improve collection activity. However, the largest expenditures in this area was for the development of a shredder for oversized waste. The Metropolitan Sanitary District of Greater Chicago reported R. & D. projects concerning treatment of wastewater and sewage by a biological reaction which will produce a highly nitrified effluent. The County Engineer's Office of Los Angeles County reported several projects in the area of solid-waste disposal. One project studied sanitary landfills—decomposition, gas movement, and settlement—and another dealt with development of methods to improve solid-waste handling and disposal in multistory office buildings,

hospitals, and similar structures. In 1969, 43 percent of local government expenditures for R. & D. projects in the area of sanitation was financed by Federal Government agencies, principally the Federal Water Pollution Control Administration of the Department of the Interior and the Bureau of Solid Waste Management of the Department of Health, Education, and Welfare.[4]

The fourth largest functional area in local government R. & D. activity was police protection and corrections which increased more than sevenfold from 1966 to a level of $4.4 million in 1969. Approximately 80 percent of the total local government R. & D. expenditures in this function represented activity by New York City, Los Angeles City, and Los Angeles County with 48 percent, 17 percent, and 16 percent of the total, respectively, in 1969.

The R. & D. activities of the New York City Police Department included several projects designed to improve police administration and management such as the development of a mobile command post and pilot studies concerning the effectiveness of specialized squads at the precinct level. Several projects involved the engineering and mathematical sciences including development of a prototype system to utilize closed-circuit television to transmit fingerprints, and a prototype command and control center. The largest R. & D. project involved the development of new equipment and procedures for a special police emergency-call network system.

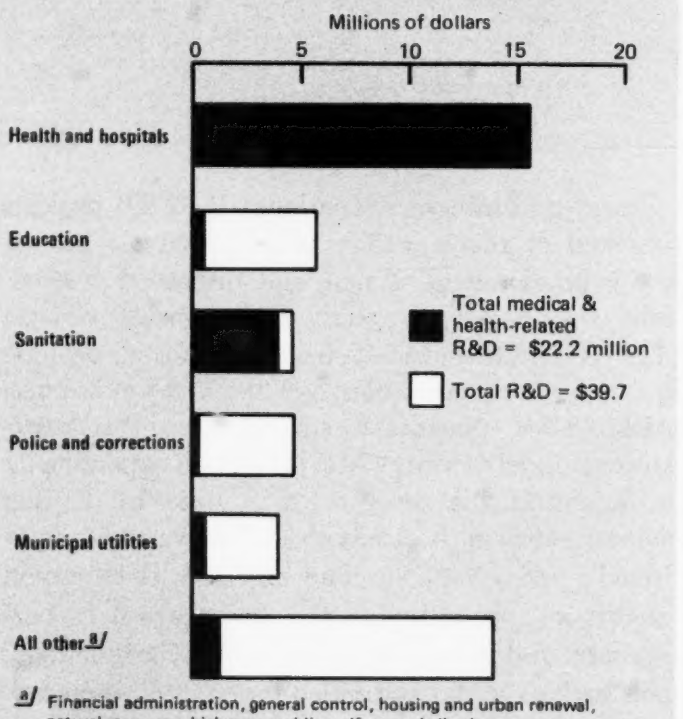
Relatively little R. & D. work in the police and corrections functional area went for correctional R. & D. activity. However, Santa Clara County (Calif.) and Los Angeles County reported R. & D. projects involving work furlough programs and probation services studies, together about 10 percent of the total local R. & D. expenditures for the police and corrections function. In contrast to the areas of health and hospitals, education, and sanitation, only 19 percent of local government R. & D. expenditures for police and corrections came from Federal Government sources. The Federal agency furnishing nearly all of this amount was the Law Enforcement Assistance Administration of the Department of Justice.

The remaining six functional areas used in this report to classify local government R. & D. projects represented less than 25 percent of the total with the range being from $3.4 million for R. & D. projects dealing with municipal utilities, to less than $100,000 for public welfare research and development. Although the level of R. & D. expenditures in these areas is low, Federal Government agencies, State governments, universities and colleges, industry, and others are all doing relatable R. & D. work which does not reflect in the data in this report but is, nonetheless, of direct concern to, and of potential use by, local governments.

Medical and health-related activities

The functional area categories used in this report classify each R. & D. project on the basis of its primary purpose, despite the fact that many projects are multifunctional. Only with respect to medical and health-related aspects of projects is an attempt made to identify and measure this important overlapping functional effort. Projects in sanitation, for example, or in municipal utilities can have obvious health implications, and local governments identified those projects that had medical and health-related aspects regardless of the primary functional area assigned. Thus medical and health-related activities can be found in each of the major primary functional areas (chart 5).

Chart 5. **Local government R&D expenditures, by functional area and proportion medical and health-related, FY 1969**



a/ Financial administration, general control, housing and urban renewal, natural resources, highways, public welfare, and all others.

Source: National Science Foundation

[4] These two agencies were transferred to the Environmental Protection Agency in 1970.

The term medical and health-related refers to a broad area of scientific inquiry aimed ultimately at the improvement of human health and the conquest of disease. It draws upon all fields of science and many disciplines within each field. Subject areas include disease-oriented research and development, health problems such as human development, accident prevention, air and water pollution, nutrition and population problems, and organization and delivery of health services. Included in this broad definition is the function of health and hospitals, plus portions of several other functions (chart 5).

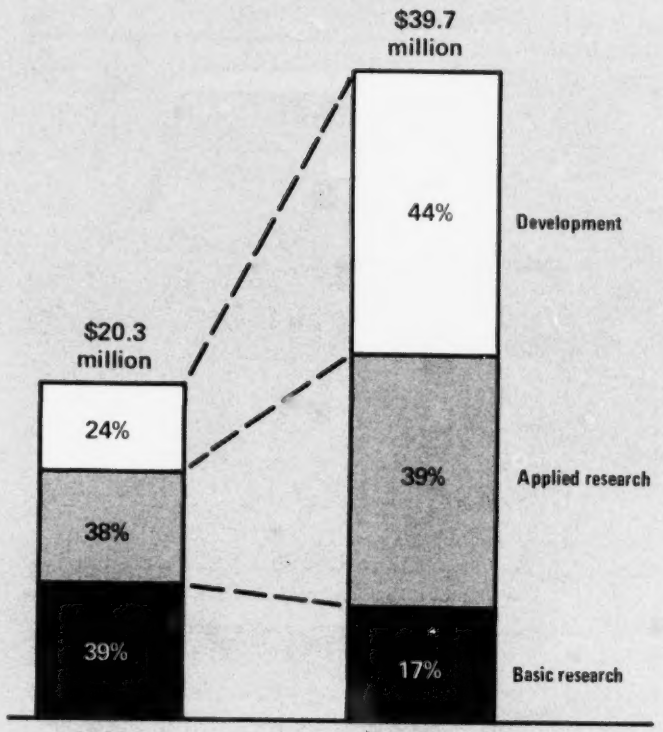
Approximately 55 percent, $22.2 million, of total local government R. & D. expenditures in 1969 were medical and health-related. This is about the same ratio as in 1966. As with overall R. & D. expenditures, municipalities and counties accounted for most of these activities, together about 80 percent; this amount is nearly identical to their proportion of overall R. & D. expenditures, and to their share of the total R. & D. expenditures for the functional area of health and hospitals. Highways and public welfare were the only two functional areas in 1969 with none of their R. & D. activities being classified as medical and health-related; however, as noted earlier, the overall R. & D. expenditures in these two areas were very small.

Examples of local government R. & D. projects primarily in one function but also medical and health-related can be found in several areas. The Bureau of Sanitation of Los Angeles City, for example, reported several projects—sanitary landfill stability, model refuse collection system, and odor control—which were classified in the function of sanitation, but were also medical and health related because they were concerned with major health problems such as solid-waste collection and disposal, and air pollution. Similarly, projects of the Metropolitan Water District of Southern California dealing with water supply, classified under the function of municipal utilities, were medical and health-related since the quality of the water supply affects the general health of the population.

Character of work, fields of science, and performers

In 1969, some 44 percent of local government R. & D. expenditures were reported in support of developmental activities. Applied research activity was reported as being nearly 40 percent of the total,

Chart 6. **Local government R&D expenditures, by character of work, FY 1966 and 1969**

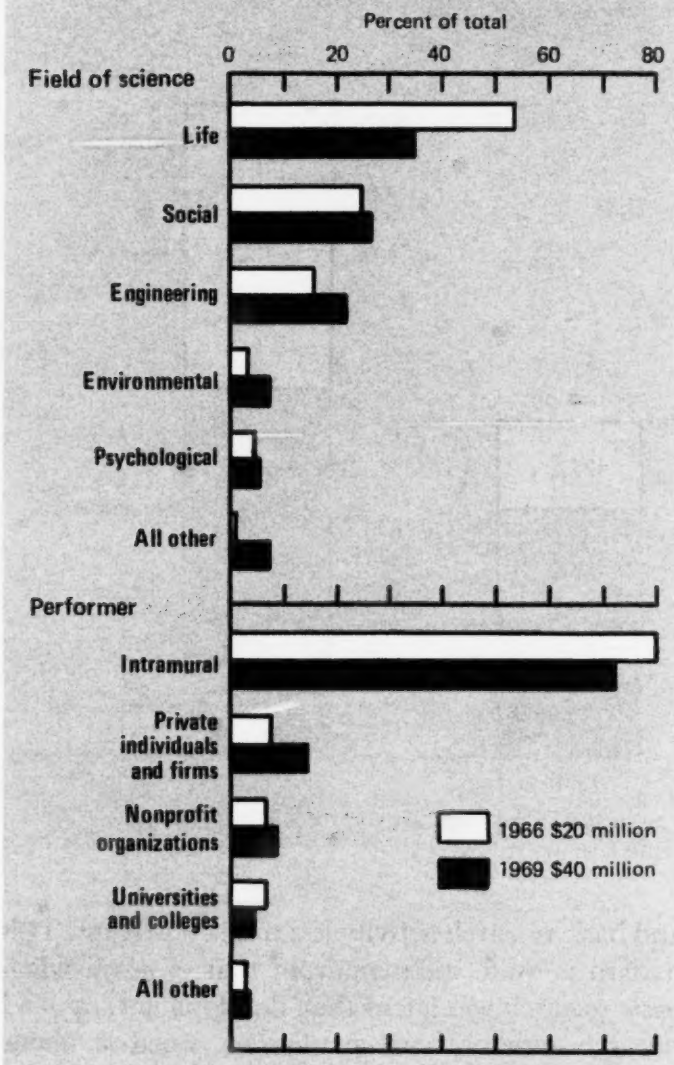


Source: National Science Foundation

and basic research activity less than 20 percent. This pattern is quite different from that of 1966 when basic research was larger than development; applied research activity, however, has remained at about the same proportion of the total (chart 6). These changes can be partially attributed to increases in the share of the total represented by the functional areas of sanitation and police and corrections where the work being conducted is largely developmental. In addition, the proportion of basic research work in the functional area of health and hospitals has decreased from 60 percent of the total to 40 percent. This shift is due primarily to two reasons; first, a change in the character of work pattern of the National Institutes of Health which funds a large part of the health and hospital R. & D. total of local governments (from 40 percent basic research in 1966 to 32 percent in 1969); second, a change in emphasis by local governments from basic research to applied research and development where more immediate problems are involved and faster results anticipated.

These changes are also responsible for the differences in the fields of science and performer distri-

Chart 7. **Local government R&D expenditures, by field of science and performer, FY 1966 and 1969**



Source: National Science Foundation

butions between 1966 and 1969 as shown in chart 7. The engineering and environmental sciences show increases because these fields are closely identified with the areas of sanitation and municipal utilities, which also increased greatly between 1966 and 1969. However, the social sciences, which showed a small increase in the share of the total, are associated more with the areas of education and police and corrections. Nonetheless, the life sciences—the clinical medical and biological sciences whose overall share declined—remained the largest field, 34 percent in 1969, because of continuing local government concentration in the area of health and hospitals.

With respect to performers (who actually did the R. & D. work), approximately 70 percent of total local government R. & D. expenditures represented work performed by the local agencies themselves (intramural performance) with most of the remainder contracted out to private individuals or firms, 14 percent, and nonprofit organizations, 8 percent. This pattern is somewhat less pronounced than in 1966 when intramural performance represented 80 percent of the total. Local governments have relied primarily on extramural performers for R. & D. work in the areas of sanitation and police and corrections in order to take advantage of the expertise of these outside performers.

R. & D. plant

Local government expenditures for R. & D. plant totaled $2 million in fiscal year 1968 and $7.2 million in fiscal year 1969. These expenditures include the acquisition of land, structures, and fixed equipment used in the conduct of research and development. Comparable R. & D. plant expenditures in 1966 and 1967 were $0.8 million and $2.8 million, respectively.

Support for R. & D. plant tends to fluctuate from year to year for local governments and the other R. & D. performing sectors. Such fluctuations, however, are not necessarily indications of policy changes with respect to the R. & D. projects which the R. & D. plant supports. An R. & D. plant item may be purchased one year for use in R. & D. projects extending over several years; R. & D. plant expenditures could, therefore, be high for the year of purchase but not for succeeding years even though the item was in continuous use.

Unlike local government R. & D. expenditures, those for R. & D. plant were largely financed by the local governments themselves—77 percent in 1969. Federal Government sources represented nearly all of the remainder with only a nominal amount provided by State governments and other sources. It should be recognized that the volume of R. & D. activity at the local level is not always sufficient to justify construction or purchase of fixed equipment solely for R. & D. purposes. Therefore, the data for R. & D. plant represent in many cases, allocations or estimates of the R. & D. plant proportion of capital expenditures for items whose primary purpose is other than research and development.

PART II. Local Government Personnel Engaged in Research and Development

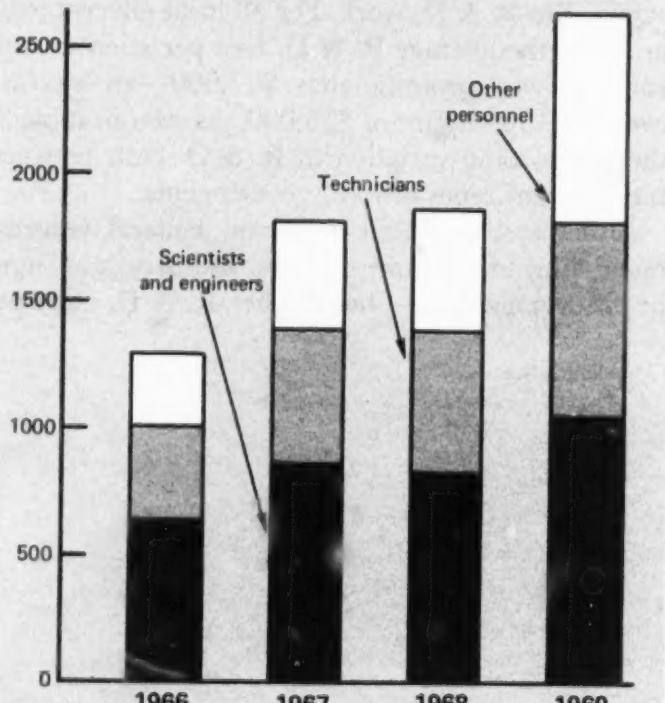
PERSONNEL engaged in local government R. & D. activities consist of scientists and engineers, technicians, and "other" supporting employees such as administrative and clerical personnel. (See technical notes for definitions.) The data presented relate only to the intramural performance of research and development and, hence, do not include the R. & D. personnel working on R. & D. projects contracted out by local governments to other performers such as industrial firms, universities and colleges, and nonprofit organizations. Since most local governments do not employ persons solely for the performance of research and development, the data were collected on a full-time equivalent (FTE) basis in order to account for the "part-time" activity. On an FTE basis, two scientists or engineers each working 6 months on a project would be counted as one FTE scientist or engineer.

Local governments employed a total of 1,875 FTE R. & D. personnel in their intramural R. & D. work in 1968 and 2,629 in 1969. Of these personnel, approximately 40 percent were scientists or engineers, with technicians and other personnel both representing 30 percent each. As shown in chart 8, the proportion of total local government R. & D. personnel represented by scientists and engineers declined between 1966 and 1969. This decline was offset by a rise in use of other personnel while the proportion for technicians remained about the same.

The ratio of technicians to scientists and engineers is one measure of the "mix" of personnel engaged in research and development. In 1969, the ratio was 74 technicians per 100 scientists and engineers engaged in local government-performed research and development. This ratio is considerably higher than the 1966 figure of 58 technicians per 100 scientists and engineers. The local government technician-to-scientist and engineer ratio is approximately the same as that of State government agencies but considerably higher than that of either universities and colleges or industry. Factors responsible for variation in the technician ratio between sectors include differences in the nature of the R. & D. work being performed, cost and personnel hiring difficulties (State and local governments have greater difficulty in hiring scientists and engineers than the other sectors because of generally lower salary levels), and differences in classification of certain categories of personnel by the various sectors.

There is a wide difference between the types of local governments with respect to this technician-to-

Chart 8. FTE [a] number of personnel engaged in research and development performed by local governments, 1966-69



a/ Full-time equivalent.
Source: National Science Foundation

scientist and engineer ratio. The lowest ratio is for school districts which had 13 technicians per 100 scientists and engineers while special districts used 111 technicians per 100 scientists and engineers. These variations can be attributed to differences in the nature of the R. & D. work conducted by the different types of local governments. School districts concentrate largely on curriculum development and related subjects which require relatively few technicians. Special districts, on the other hand, are involved in engineering-related R. & D. work which requires considerably more technicians. Municipalities and counties, which represent most of the R. & D. expenditures and personnel, have more diversified R. & D. activities; their ratios fall in between two extremes.

Another measure of scientific manpower utilization is the R. & D. cost per scientist and engineer engaged in R. & D. work. For all local governments in 1969, the average R. & D. cost per scientist and engineer was approximately $27,000—an increase over the 1966 figure of $25,000. As seen in table 3, there was some variation in R. & D. costs between the different types of local governments.

Other sectors—State agencies, Federal Government, universities and colleges, industry, and nonprofit organizations—had higher R. & D. costs per scientist and engineer, all above $33,000. Part of the reason that local governments are lower can be attributed to the previously mentioned lower salary levels of scientists and engineers in local governments. In addition, material costs are generally lower for the type of R. & D. work being conducted by local governments than for R. & D. work conducted by the other sectors. The Federal Government's R. & D. efforts, for example, often require sophisticated, complex, and expensive equipment such as missiles, aircraft, and satellites.

TABLE 3.—*R. & D. cost per scientist and engineer in local governments, by type of government, fiscal year 1969*

Type of government	Intramural R. & D. expenditures (thousands)	Scientists and engineers	R. & D. cost per scientist and engineer
Total	$28, 168	1, 052	$26, 776
Municipalities	13, 560	495	27, 394
Counties	7, 799	263	29, 654
Special districts	1, 739	53	32, 811
School districts	2, 484	129	19, 256
All other [1]	2, 587	112	23, 098

[1] Hospital districts and townships.

PART III. Comparison of Local, State, and Federal Government R. & D. Activities

General characteristics

The three levels of government—local, State, and Federal—differ widely in the level and nature of their R. & D. activities. Local and State governments are more similar to each other than either is to the Federal Government. As had been mentioned earlier, the R. & D. activities of the three levels of governments are not always separate and distinct entities; there are many interrelationships and overlapping operations being conducted.

The level of expenditures for research and development is the most outstanding difference among the three governmental sectors. In 1969, Federal expenditures for research and development totaled $15.7 billion while those by local governments and State governments (1968 data) amounted to $40 million and $155 million, respectively. Of these expenditures by local and State governments, some $18 million and $76 million respectively, represent funds furnished by Federal agencies. Thus, despite the fact that less than one-half of 1 percent of total Federal funds for R. & D. purposes goes to local and State governments, these funds represent 46 percent of total local R. & D. expenditures and 50 percent of those of State government agencies.

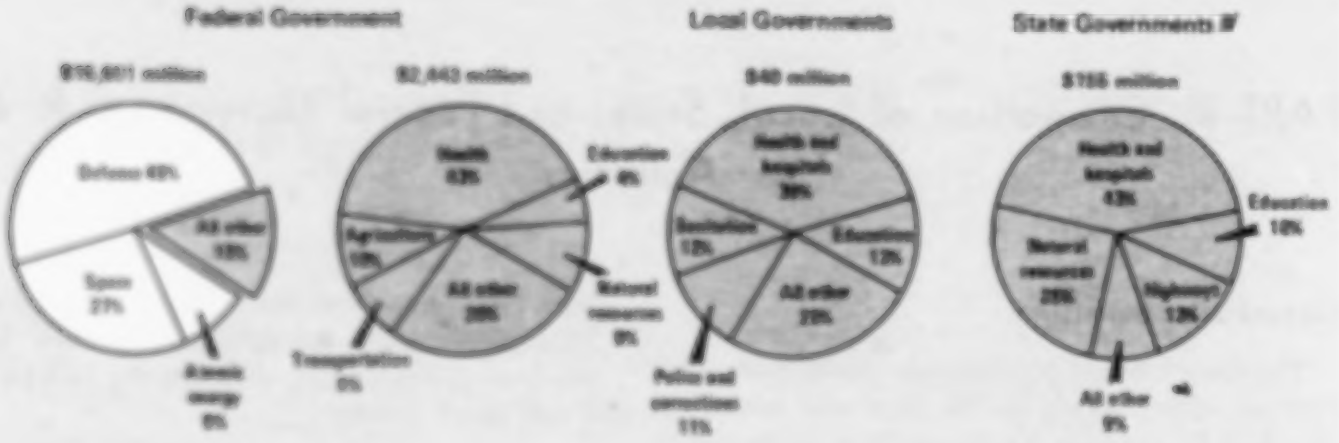
It should be noted, however, that a very large portion—85 percent in 1969—of Federal R. & D. funds are in the areas of defense, space, and atomic energy. These are areas in which local and State governments have virtually no direct responsibility. If these three areas of national activity are excluded from the comparison made above with local and State governments, the difference between the sectors is considerably less, although the Federal effort is still much greater.

Functional areas

A comparison of the total R. & D. expenditures of the three governmental sectors by function shows that: (*a*) local and State governments allocate about the same proportions of their total R. & D. resources to the areas of health and education but are, otherwise, not similar in their functional R. & D. pattern; (*b*) the overall Federal R. & D. pattern is not similar to that of either local or State governments; (*c*) the Federal pattern, when the areas of defense, space exploration, and atomic energy are deleted, is similar to local and State government only in the proportion devoted to the function of health (chart 9).

The data thus seem to indicate that, with the exception of health and education, the R. & D. efforts of local and State governments are complementary to each other and with those of the Federal Government even after the Federal funding portion of the local and State government R. & D. effort is excluded from the comparisons. And there is some evidence to indicate that this complementary aspect may also be true within the functional area of health since Federal health R. & D. efforts are primarily disease-oriented while local and State governments devote more of their health R. & D. resources to the development of improved community health services including better treatment techniques.

Chart 9. **Government expenditures for research and development, by function, FY 1969**



From year 1969 data.
Source: National Science Foundation

Character of work, fields of science, and performers

Table 4 compares the R. & D. activities of the three governmental levels by character of work (whether the R. & D. work was basic research, applied research, or development), performer (the type of organization actually doing the R. & D. work), and field of science. Local and State governments are more similar in these three respects to each other than either is to the patterns of the Federal Government.

The Federal Government spends the bulk of its R. & D. outlays for developmental work, most of which represents activity by the defense-space-atomic energy group of agencies. Work in these areas is by its very nature developmental and largely in the engineering and physical sciences. And, in addition, most of the actual work is performed by outside private industrial firms where the capability and facilities exist. These facts account for the differences between the Federal Government patterns and local and State governments where most of the R. & D. work is in the areas of health and hospitals and education. In these areas, which mostly involve the life sciences and social sciences, respectively, the local and State governments are able to perform most of the work (essentially applied research and development) themselves.

TABLE 4.—*Comparisons of local government R. & D. activities with those of State and Federal agencies*

[Percent distribution]

Characteristics	Local governments [1]	State government agencies [2]	Federal agencies [3]
Total	100	100	100
Character of work:			
Basic research	17	23	13
Applied research	39	50	20
Development	44	27	67
Performer:			
Intramural	71	82	22
Universities and colleges	4	9	10
Private firms	14	4	56
Other	12	5	12
Field of science: [4]			
Life	43	60	29
Engineering	12	15	29
Physical	(5)	1	22
Social	23	10	6
Environmental	9	7	11
Other	13	7	6

[1] Based on 1969 data excluding R. & D. plant.
[2] Based on 1968 data excluding R. & D. plant.
[3] Based on 1969 data excluding R. & D. plant.
[4] Research only.
[5] Less than 0.5 percent.

APPENDIXES

A. Technical Notes

B. Statistical Tables

C. R. & D. Activities of Universities and Colleges Controlled by Local Governments, 1968

D. Reproduction of Survey Questionnaire

APPENDIX A

Technical Notes

THESE TECHNICAL NOTES deal with the scope and methodology of the survey, definition of terms used, criteria used for classification of local governments, functional area classifications, and the relationship of this report to (1) the previous report on local government R. & D. activities, and (2) to the NSF Survey of Institutions of Higher Education. Limitations of the data are covered where appropriate, throughout the analysis.

Scope and methodology

Because there were 81,000 local governments throughout the country in 1967, a sample was used to collect data for this report. Six types of governmental units—municipalities, counties, independent school districts, special districts, hospital districts, and townships—made up the survey universe for this report.

Based on the 1960 Census of Population, all municipalities with a population 100,000 or more, all counties with at least 250,000 persons, and all townships (in those 12 States where these are an important form of government) with a population of 50,000 or more, were included. Selections for the remaining types of governments were based on the 1967 Census of Governments. Included in the panel were school districts having a pupil enrollment of 25,000, or more, in October 1966, and the 100 largest special districts and 100 largest hospital districts, according to their expenditures during fiscal year 1967. A few units which did not fall within the established parameters, but were believed to be carrying out some R. & D. activities, also received questionnaires.

To facilitate the reporting procedures for the counties, municipalities, and townships, these types of units were given the option of either centrally reporting their R. & D. activities, or listing on a separate form the names and addresses of those dependent agencies of their government which might have carried out some research and development during 1968 and 1969. These units were then sent their own questionnaires to be completed for only that particular agency. In all, 713 independent units and 307 dependent agencies of the larger counties, municipalities, and townships, were mailed forms making a total sample of 1,020 governmental units and their agencies.

Because the great majority of research and development at the local government level is carried out by the larger units, the sample selected undoubtedly covered the overwhelming majority of local government R. & D. activities during fiscal 1968 and 1969. This assumption is substantiated by the fact that not even 20 percent of the municipalities that reported some R. & D. projects had populations of less than 150,000, although cities of that size comprised almost 50 percent of the municipalities in the survey. The same situation exists at the county government level. Whereas approximately one-fourth of the counties reporting research and development had less than 350,000 persons, counties of that size constituted almost 40 percent of all counties in the panel.

In addition, the number of units surveyed which reported any research and development was quite small. Of the 713 local governments responding to the survey, 147 reported expenditures for R. & D. projects in fiscal year 1969. It is possible, however, that some governments not receiving questionnaires could have conducted some R. & D. activity, but this would not be statistically significant compared to the amounts reported here.

Survey operations and data tabulations were performed by the Bureau of the Census for the National Science Foundation. The NSF staff prepared the report. The questionnaire used was similar to that used in the previous local government R. & D. survey and the one used in the latest State government R. & D. survey.

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As the questionnaires were returned, they were examined by the Census Bureau and NSF for completeness, consistency, and accuracy. Various lists of Federal grants were used as quality checks, and any government listed as having received a grant but not reporting it, received a telephone call to obtain the needed information. Also, units which had reported R. & D. projects on the last local government R. & D. survey received phone calls if these projects were not reported on the current survey.

Definitions

Research and development (R. & D.) activities were defined as follows for this report:

Research is systematic, intensive study directed toward fuller scientific knowledge or understanding of the subject studied. Research may be classified as either basic or applied. In *basic research* the investigator is concerned primarily with gaining a fuller knowledge or understanding of the subject under study. In *applied research* the investigator is primarily interested in a practical use of the knowledge or understanding for the purpose of meeting a recognized need.

Development, or the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes. It represents the application of the findings of research to meet practical problems.

R. & D. plant, or, facilities, land, structures, fixed equipment, and any construction, major repairs, and alterations of the foregoing used in the conduct of research and development.

R. & D. personnel classifications used in this report were:

Scientists and engineers are persons engaged in scientific or engineering work and having at least a bachelor's degree or equivalent work experience in the appropriate field.

Technicians are persons engaged in scientific or engineering work and having the technical knowledge equivalent to at least 2 years of training in the appropriate field beyond the high school level.

Other personnel are typists, clerks, administrative personnel, and others supporting the R. & D. work.

The criteria for classifying local governments established by the Bureau of the Census has been used for this study.[1]

[1] Department of Commerce, Bureau of the Census, *1967 Census of Governments-Governmental Organization* (Washington, D.C. 20402: Superintendent of Documents, U.S. Government Printing Office, 1968).

Functional area classification

The functional area classification used in this report are among those used by the Bureau of the Census to collect and report data on the overall finances of local governments. The definitions, as shown below, include all activity under that particular function not only the research and development portion.

(1) *Health and Hospitals*

Health includes health services, other than hospital care, and financial support of health programs of other governments. It includes public health research, nursing, immunization, maternal and child health, and other categorical, environmental, and general health activities. It does not include vendor payments for health services administered under public welfare programs.

Hospitals include establishment and operation of hospital facilities, institutions primarily for care and treatment—rather than education—of the handicapped, provision of hospital care, and support of other public or private hospitals. It does not include vendor payments for hospital care administered as a part of public assistance programs.

(2) *Education*

Under this area are public schools; educational institutions, e.g., for blind, deaf, and other handicapped individuals; supervision of education; and any other activities and facilities related to education that are administered by school boards, systems, or commissions. This survey does not include institutions of higher education and their affiliated hospitals, agricultural experiment stations, or research centers.

(3) *Sanitation*

This category encompasses the provision and maintenance of municipal sewers and sewage disposal facilities, and also street cleaning, waste collection and disposal activities. It does not include smoke regulation, sanitary engineering, and other sanitary regulation for health purposes.

(4) *Police and Corrections*

This heading covers preservation of law and order and traffic safety. It includes crime prevention activities, detention and custody of persons awaiting trial, highway patrols, and the like. It also includes as corrections confinement and correction of adults and minors convicted of offenses against the law, and pardon, probation, and parole activities.

(5) *Municipal Utilities*

This category includes purchase or construction of utility facilities, and production of, or acquisition and distribution of, utility commodities, and services for sale to the general public or to other governments. For this survey, this category relates only to water supply and transit systems.

(6) *Financial Administration and General Control*

Financial administration includes activities involving finance and taxation. It includes the work of control agencies in accounting, auditing, and budgeting; the supervision of local government finance; tax administration; collection, custody, and disbursement of funds; administration of employee retirement systems; debt and investment administration; and the like.

General control covers the legislative and judicial branches of the government, the office of the chief executive, and auxiliary agencies and staff services responsible for law, recording of general public reporting, overall planning and zoning, personnel administration and the like. Internal control activities of individual departments or agencies are classed under the particular function.

(7) *Housing and Urban Renewal*

This category includes construction and operation of housing and redevelopment projects and other activities to promote or aid housing and urban renewal.

(8) *Natural Resources*

This heading encompasses activities to conserve, promote, and develop fish and game, forestry and parks, and other soil and water resources, including geological research, flood control, irrigation, drainage, and other conservation activities.

(9) *Highways*

This category embraces streets, highways, and structures necessary for their use, snow and ice removal, and street or highway lighting. It includes street and highway planning and engineering, including related traffic engineering administered by highway or public works agencies.

(10) *Public Welfare*

This category consists of support or assistance to needy persons commensurate with their needs. Direct expenditure under this hearing includes cash assistance payments to beneficiaries under Federal categorical programs and various State-administered programs; segregable payments directly to private vendors for medical care, burials, and other commodities, and services provided under welfare programs for the needy; all direct administration of public wlefare activities other than institutional administration.

(11) *Other*

This term includes any function not belonging in one of the 10 categories described above.

Relation to previous local government R. & D. report

The first study on the R. & D. activities of local governments covered fiscal years 1966 and 1967 and was conducted on the same basis as the current report. There are, however, a few differences between the reports even though the data are comparable.

Changes in the field of science categories were made in the latest survey to reflect revisions made in the Federal Government and State government agencies. The agricultural life sciences were formerly separately identified but are now included among the biological sciences. In addition, data by detailed physical science were not collected in the later survey since very little R. & D. activity takes place in these fields. The fields of science categories used in this report are shown on page 4 of the sample survey questionnaire in appendix D.

Another difference between the two reports was the functional area of sewers and sewage disposal. This term is not used in the current report but the activities reported under this category are now included in the functional area of sanitation. This function also includes solid-waste disposal which was not shown in the previous report.

Relation to NSF survey of institutions of higher education

Since the National Science Foundation conducts a survey of all institutions of higher education in its Survey of Scientific Activities of Institutions of Higher Education, universities and colleges controlled by local governments are not included in this report. However, a summary of R. & D. activity of

these institutions is presented in appendix C (with several statistical tables) to give an overall view of the nature and extent of their R. & D. involvement.

The terminology in the NSF survey of universities and colleges is somewhat different from that used in this report on local governmental units. "Separately budgeted research and development" is used in the former survey to distinguish such expenditures from departmental research (financed through regular departmental funds), which is covered separately in that survey. In this report, the term "research and development," is used correspondingly, and appears in the tables in appendix C on local universities and colleges.

APPENDIX B

Statistical Tables

Page

SUMMARY BY STATE AND INDIVIDUAL LOCAL GOVERNMENT

B–1. Local government expenditures for research, development, and R. & D. plant, by State, type and individual local government, and character of work, fiscal years 1968 and 1969.... 21

SOURCE OF FUNDS

B–2. Local government expenditures for research and development, by type of local government and source of funds, fiscal years 1968 and 1969..... 25

B–3. Fifty local governments leading in research and development expenditures, by type and individual local government, and source of funds, fiscal years 1968 and 1969..... 26

B–4. Local government expenditures for R. & D. plant, by type of local government and source of funds, fiscal years 1968 and 1969..... 27

FUNCTIONAL AREA

B–5. Local government expenditures for research and development, by type of local government and functional area, fiscal years 1968 and 1969..... 27

B–6. Fifty local governments leading in research and development expenditures, by type and individual local government, and functional area, fiscal years 1968 and 1969..... 28

B–7. Local government expenditures for basic research, by type of local government and functional area, fiscal years 1968 and 1969..... 30

B–8. Local government expenditures for applied research, by type of local government and functional area, fiscal years 1968 and 1969..... 31

B–9. Local government expenditures for development, by type of local government and functional area, fiscal years 1968 and 1969..... 31

MEDICAL AND HEALTH-RELATED

B–10. Local government expenditures for medical and health-related research, development, and R. & D. plant, by type of local government and character of work, fiscal years 1968 and 1969..... 31

B–11. Local government expenditures for medical and health-related research, development, and R. & D. plant, by type of local government and functional area, fiscal years 1968 and 1969..... 32

CHARACTER OF WORK

B–12. Local government expenditures for research, development, and R. & D. plant, by State and character of work, fiscal years 1968 and 1969..... 33

B–13. Local government expenditures for research, development, and R. & D. plant, by type of local government and character of work, fiscal years 1968 and 1969..... 34

B–14. Local government expenditures for research, development, and R. & D. plant, by type and individual local government, and character of work, fiscal years 1968 and 1969..... 35

FIELD OF SCIENCE

Page

B–15. Local government expenditures for research and development, by type of local government and field of science, fiscal years 1968 and 1969 38

B–16. Local government expenditures for basic research, by type of local government and field of science, fiscal years 1968 and 1969 38

B–17. Local government expenditures for applied research, by type of local government and field of science, fiscal years 1968 and 1969 39

B–18. Local government expenditures for development, by type of local government and field of science, fiscal years 1968 and 1969 39

PERFORMERS

B–19. Local government expenditures for research and development, by type of local government and performing organization, fiscal years 1968 and 1969 40

B–20. Fifty local governments leading in research and development expenditures, by type and individual local government, and performing organization, fiscal years 1968 and 1969 41

PERSONNEL

B–21. Full-time equivalent number of personnel engaged in research and development in local governments, by type of local government, fiscal years 1968 and 1969 42

HISTORICAL

B–22. Local government expenditures for research, development, and R. & D. plant, by type of local government and character of work, fiscal years 1966–1969 42

B–23. Local government expenditures for research and development, by type of local government and functional area, fiscal years 1966–1969 43

B–24. Local government expenditures for research and development, by type of local government and source of funds, fiscal years 1966–1969 44

B–25. Local government expenditures for research and development, by type of local government and field of science, fiscal years 1966–1969 45

B–26. Local government expenditures for research and development, by type of local government and performing organization, fiscal years 1966–1969 46

Table B-1. Local Government Expenditures for Research, Development, and R&D Plant, by State. Type and Individual Local Government, and Character of Work, Fiscal Years 1968 and 1969

(Thousands of dollars)

State, type and individual government	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
United States, total	31,455	46,840	29,431	39,688	6,400	6,742	12,656	15,474	10,375	17,473	2,025	7,151
Arizona	169	298	165	295	-	-	129	163	36	132	3	4
Municipalities	35	70	35	70	-	-	-	-	35	70	-	-
Scottsdale	35	70	35	70	-	-	-	-	35	70	-	-
Counties	1	12	1	12	-	-	-	-	1	12	-	-
Pima	1	12	1	12	-	-	-	-	1	12	-	-
Special districts	61	94	58	91	-	-	58	91	-	-	3	4
Salt River Project Agricultural Improvement Power District	61	94	58	91	-	-	58	91	-	-	3	4
School districts	71	122	71	122	-	-	71	72	-	50	-	-
Tucson School District 1	71	122	71	122	-	-	71	72	-	50	-	-
Arkansas	8	20	8	20	-	-	8	20	-	-	-	-
School districts	8	20	8	20	-	-	8	20	-	-	-	-
Little Rock School District	8	20	8	20	-	-	8	20	-	-	-	-
California	6,580	8,778	5,988	6,950	142	239	3,579	3,869	2,268	2,841	591	1,827
Municipalities	2,569	4,097	2,240	2,962	17	41	1,109	1,307	1,114	1,614	330	1,135
Los Angeles	1,958	2,383	1,692	1,718	13	24	741	768	938	926	266	666
San Francisco	386	1,117	371	648	-	-	240	376	131	272	15	469
San Jose	172	512	124	512	4	17	76	84	45	412	48	-
San Diego	32	41	32	41	-	-	32	41	-	-	-	-
Oakland	-	23	-	23	-	-	-	18	-	5	-	-
Long Beach	22	20	20	20	-	-	20	20	-	-	2	(a)
Counties	2,225	3,305	2,129	2,767	109	181	1,210	1,501	809	1,085	97	537
Los Angeles	1,851	2,938	1,754	2,400	45	71	1,136	1,486	573	843	97	537
Santa Clara	236	242	236	242	-	-	-	-	236	242	-	-
San Mateo	12	49	12	49	-	34	12	15	-	-	-	-
San Bernardino	27	39	27	39	27	39	-	-	-	-	-	-
San Diego	37	37	37	37	37	37	-	-	-	-	-	-
Alameda	43	-	43	-	-	-	43	-	-	-	-	-
Fresno	20	-	20	-	-	-	20	-	-	-	-	-
Special districts	1,180	1,102	1,050	950	13	14	781	864	257	72	130	151
Los Angeles Sanitation District	190	319	190	295	-	-	190	295	-	-	-	24
Metropolitan Water District of Southern Calif	333	219	312	210	-	-	300	138	13	72	20	9
Orange Water District	220	208	120	108	-	-	120	108	-	-	100	100
Alameda-Contra Costa Transit District	-	192	-	192	-	-	-	192	-	-	-	-
Eastern Municipal Water District	70	60	70	52	-	-	70	52	-	-	-	9
Coachella Valley Water District	66	49	66	49	-	-	66	49	-	-	-	-
Imperial Irrigation District	32	32	23	23	13	13	10	10	-	-	9	9
East Bay Municipal Utility District	25	20	25	20	-	-	25	20	-	-	-	-
Housing Authority of the City and County of San Francisco	-	1	-	1	-	1	-	-	-	-	-	-
Central Basin Municipal Water District	(a)	(a)	(a)	(a)	-	-	-	-	(a)	(a)	-	-
San Francisco Bay Area Rapid Transit District	244	-	244	-	-	-	-	-	244	-	-	-
West Basin Municipal Water District	(a)	-	(a)	-	-	-	-	-	(a)	-	-	-
School districts	578	263	548	259	-	-	463	194	84	65	31	4
San Jose Unified School District	215	197	205	193	-	-	205	193	-	-	11	4
Tampalais Union High School District	11	22	11	22	-	-	-	-	11	22	-	-
Palo Alto Unified School District	5	20	5	20	-	-	-	-	5	20	-	-
Hayward Unified School District	63	18	63	18	-	-	-	-	63	18	-	-
Richmond Unified School District	5	5	5	5	-	-	-	-	5	5	-	-
Santa Ana Unified School District	-	1	-	1	-	-	-	1	-	-	-	-
Fremont Unified School District	187	-	167	-	-	-	167	-	-	-	20	-
San Diego Unified School District	92	-	92	-	-	-	92	-	-	-	-	-
Hospital districts	26	11	23	11	3	3	16	3	4	5	4	-
Peninsula Hospital District	4	5	4	5	-	-	-	-	4	5	-	-
Kaweah Delta Hospital District	3	3	3	3	-	-	3	3	-	-	-	-
Eden twp. Hospital District	3	3	3	3	3	3	-	-	-	-	-	-
Marin Hospital District	18	-	13	-	-	-	13	-	-	-	4	-

[a] Less than 500 dollars.

Table B-1. **Local Government Expenditures for Research, Development, and R&D Plant, by State, Type and Individual Local Government, and Character of Work, Fiscal Years 1968 and 1969**–Continued

(Thousands of dollars)

State, type and individual government	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Colorado	285	508	265	366	-	-	265	318	-	48	20	142
Municipalities	24	244	4	102	-	-	4	54	-	48	20	142
Denver	24	244	4	102	-	-	4	54	-	48	20	142
School districts	261	264	261	264	-	-	261	264	-	-	-	-
Denver City-Co.School District 1	261	196	261	196	-	-	261	196	-	-	-	-
Boulder Valley School District No. RE 2	-	68	-	68	-	-	-	68	-	-	-	-
Connecticut	361	422	361	422	-	-	361	422	-	-	-	-
Municipalities	361	422	361	422	-	-	361	422	-	-	-	-
Hartford	361	422	361	422	-	-	361	422	-	-	-	-
District of Columbia	879	611	879	611	-	-	562	50	317	562	-	-
Municipalities	825	476	825	476	-	-	562	50	263	426	-	-
District of Columbia	825	476	825	476	-	-	562	50	263	426	-	-
Special districts	54	136	54	136	-	-	-	-	54	136	-	-
Washington Metropolitan Area Transit Commission	54	136	54	136	-	-	-	-	54	136	-	-
Florida	932	1,285	932	1,285	-	-	617	965	315	318	-	-
Municipalities	251	422	251	422	-	-	251	422	-	-	-	-
Jacksonville	251	417	251	417	-	-	251	417	-	-	-	-
Tampa	-	5	-	5	-	-	-	5	-	-	-	-
Counties	251	410	251	410	-	-	247	407	4	3	-	-
Dade	247	407	247	407	-	-	247	407	-	-	-	-
Orange	4	3	4	3	-	-	-	-	4	3	-	-
Special districts	112	154	112	154	-	-	98	114	14	40	-	-
Central and Southern Fla. Flood Control District	112	154	112	154	-	-	98	114	14	40	-	-
School districts	297	276	297	276	-	-	-	-	297	276	-	-
Brevard School District	193	68	193	68	-	-	-	-	193	68	-	-
Broward Board of Public Instruction	104	208	104	208	-	-	-	-	104	208	-	-
Hospital districts	21	22	21	22	-	-	21	22	-	-	-	-
Duval Co. Hospital Authority	21	22	21	22	-	-	21	22	-	-	-	-
Georgia	206	307	206	307	108	109	42	137	57	61	-	-
Municipalities	27	93	27	93	-	-	-	67	27	26	-	-
Atlanta	-	67	-	67	-	-	-	67	-	-	-	-
Savannah	27	26	27	26	-	-	-	-	27	26	-	-
Counties	86	86	86	86	86	86	-	-	-	-	-	-
Evans	86	86	86	86	86	86	-	-	-	-	-	-
School districts	62	87	62	87	-	-	33	53	30	34	-	-
Atlanta Independent School District	62	87	62	87	-	-	33	53	30	34	-	-
Hospital districts	31	40	31	40	22	23	9	17	-	-	-	-
Chatham Co. Hospital Authority	31	40	31	40	22	23	9	17	-	-	-	-
Illinois	3,716	4,589	3,663	4,449	2,506	2,452	563	904	595	1,094	53	140
Municipalities	836	1,103	836	1,103	321	397	15	250	501	456	-	-
Chicago	836	1,103	836	1,103	321	397	15	250	501	456	-	-
Counties	2,185	2,055	2,185	2,055	2,185	2,055	-	-	-	-	-	-
Cook	2,185	2,055	2,185	2,055	2,185	2,055	-	-	-	-	-	-
Special districts	695	1,431	642	1,291	-	-	548	654	94	638	53	140
Chicago Transit Authority	337	801	337	801	-	-	243	319	94	482	-	-
Metropolitan Sanitary District of Greater Chicago	358	571	305	481	-	-	305	335	-	146	53	90
Greater Peoria Sanitary District	-	60	-	10	-	-	-	-	-	10	-	50
Indiana	485	959	485	959	100	124	361	801	25	34	-	-
Municipalities	18	55	18	55	-	-	18	55	-	-	-	-
Gary	18	55	18	55	-	-	18	55	-	-	-	-
Counties	32	36	32	36	-	-	16	18	16	18	-	-
Bartholomew	32	36	32	36	-	-	16	18	16	18	-	-
Hospital districts	436	869	436	869	100	124	327	728	9	16	-	-
Marion Co. Health and Hospital Corporation	436	869	436	869	100	124	327	728	9	16	-	-
Iowa	-	9	-	6	-	-	-	6	-	-	-	3
Municipalities	-	9	-	6	-	-	-	6	-	-	-	3
Ames	-	9	-	6	-	-	-	6	-	-	-	3

Table B-1. **Local Government Expenditures for Research, Development, and R&D Plant, by State, Type and Individual Local Government, and Character of Work, Fiscal Years 1968 and 1969**–Continued

(Thousands of dollars)

State, type and individual government	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
New Jersey	39	477	32	474	7	-	10	306	15	168	7	3
Counties	25	384	25	384	-	-	10	278	15	106	-	-
Essex	10	208	10	208	-	-	10	208	-	-	-	-
Bergen	-	111	-	111	-	-	-	70	-	41	-	-
Monmouth	15	65	15	65	-	-	-	-	15	65	-	-
Townships	14	93	7	90	7	-	-	28	-	62	7	3
Woodbridge	14	93	7	90	7	-	-	28	-	62	7	3
New Mexico	23	53	23	53	-	-	-	-	23	53	-	-
Municipalities	23	53	23	53	-	-	-	-	23	53	-	-
Albuquerque	23	53	23	53	-	-	-	-	23	53	-	-
New York	5,961	9,477	5,749	6,763	359	366	2,566	2,427	2,824	3,970	212	2,714
Municipalities	4,804	8,009	4,671	5,450	343	351	1,572	1,209	2,757	3,890	133	2,559
New York City	4,804	8,009	4,671	5,450	343	351	1,572	1,209	2,757	3,890	133	2,559
Counties	934	1,151	856	996	16	15	787	930	51	51	79	155
Nassau	771	1,005	695	853	16	15	679	838	-	-	76	152
Westchester	163	146	160	143	-	-	109	92	51	51	3	3
Townships	223	317	223	317	-	-	207	288	16	29	-	-
Hempstead	223	317	223	317	-	-	207	288	16	29	-	-
North Carolina	-	119	-	119	-	-	-	-	-	119	-	-
Municipalities	-	119	-	119	-	-	-	-	-	119	-	-
Charlotte	-	119	-	119	-	-	-	-	-	119	-	-
Ohio	564	805	555	794	2	11	289	698	263	85	9	10
Municipalities	51	45	45	38	2	11	31	11	11	16	6	7
Dayton	48	29	42	22	-	-	31	11	10	11	6	7
Youngstown	3	16	3	16	2	11	-	-	1	5	-	-
Counties	30	7	30	7	-	-	30	7	-	-	-	-
Cuyahoga	30	7	30	7	-	-	30	7	-	-	-	-
School districts	483	753	480	749	-	-	228	680	252	69	3	4
Columbus City School District	-	264	-	264	-	-	-	264	-	-	-	-
Toledo City School District	91	243	88	243	-	-	88	243	-	-	3	-
Cincinnati City School District	320	184	320	184	-	-	108	139	212	45	-	-
Dayton City School District	72	62	72	58	-	-	32	34	40	24	-	4
Oklahoma	-	35	-	35	-	-	-	35	-	-	-	-
Counties	-	35	-	35	-	-	-	35	-	-	-	-
Tulsa	-	35	-	35	-	-	-	35	-	-	-	-
Oregon	42	125	42	125	-	-	2	72	40	53	-	-
Counties	42	53	42	53	-	-	2	-	40	53	-	-
Multnomah	42	53	42	53	-	-	2	-	40	53	-	-
Special districts	-	37	-	37	-	-	-	37	-	-	-	-
Port of Portland	-	37	-	37	-	-	-	37	-	-	-	-
School districts	-	35	-	35	-	-	-	35	-	-	-	-
Portland School District I	-	35	-	35	-	-	-	35	-	-	-	-
Pennsylvania	3,194	2,822	3,172	2,750	2,121	2,119	383	341	668	289	22	73
Municipalities	2,328	2,505	2,306	2,432	2,121	2,119	163	263	22	50	22	73
Philadelphia	2,328	2,505	2,306	2,432	2,121	2,119	163	263	22	50	22	73
Special districts	866	318	866	318	-	-	220	78	646	240	-	-
Allegheny Co. Port Authority	866	318	866	318	-	-	220	78	646	240	-	-
Tennessee	46	208	46	208	-	61	46	96	-	51	-	-
Municipalities	-	120	-	120	-	61	-	8	-	51	-	-
Chattanooga	-	111	-	111	-	60	-	-	-	51	-	-
Memphis	-	9	-	9	-	1	-	8	-	-	-	-
Counties	46	88	46	88	-	-	46	88	-	-	-	-
Shelby	46	88	46	88	-	-	46	88	-	-	-	-

Table B-1. Local Government Expenditures for Research, Development, and R&D Plant, by State, Type and Individual Local Government, and Character of Work, Fiscal Years 1968 and 1969–Continued

(Thousands of dollars)

State, type and individual government	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Kansas	42	41	42	41	-	-	27	35	15	6	-	-
Municipalities	2	10	2	10	-	-	2	10	-	-	-	-
Wichita	2	10	2	10	-	-	2	10	-	-	-	-
School districts	40	31	40	31	-	-	25	25	15	6	-	-
Kansas School District	25	25	25	25	-	-	25	25	-	-	-	-
Wichita Unified School District 259	15	6	15	6	-	-	-	-	15	6	-	-
Kentucky	7	132	7	131	-	-	7	131	-	-	-	1
Municipalities	-	14	-	14	-	-	-	14	-	-	-	-
Louisville	-	14	-	14	-	-	-	14	-	-	-	-
School districts	7	118	7	117	-	-	7	117	-	-	-	1
Breathitt Co. School District	7	87	7	87	-	-	7	87	-	-	-	-
Jefferson Co. School District	-	31	-	30	-	-	-	30	-	-	-	1
Louisiana	7	12	7	12	-	-	7	12	-	-	-	-
School districts	7	12	7	12	-	-	7	12	-	-	-	-
Caddo Parish School District	7	12	7	12	-	-	7	12	-	-	-	-
Maryland	1,553	1,794	1,525	1,761	298	269	367	750	861	742	27	33
Municipalities	771	1,170	755	1,147	298	269	160	548	298	329	16	24
Baltimore	771	1,170	755	1,147	298	269	160	548	298	329	16	24
Counties	662	520	651	510	-	-	120	130	531	380	11	10
Anne Arundel	356	274	344	265	-	-	-	-	344	265	11	10
Montgomery	221	159	221	159	-	-	34	44	187	115	-	-
Prince Georges	86	87	86	87	-	-	86	87	-	-	-	-
Special districts	119	104	119	104	-	-	87	72	33	33	-	-
The Maryland National Capital Park and Planning Commission	119	104	119	104	-	-	87	72	33	33	-	-
Massachusetts	922	2,834	922	2,834	227	303	695	698	-	1,833	-	-
Municipalities	843	2,644	843	2,644	227	303	616	508	-	1,833	-	-
Boston	840	2,628	840	2,628	227	303	613	492	-	1,833	-	-
Quincy	3	12	3	12	-	-	3	12	-	-	-	-
Springfield	-	5	-	5	-	-	-	5	-	-	-	-
Special districts	79	177	79	177	-	-	79	177	-	-	-	-
Mass. Bay Transit Auth.	79	136	79	136	-	-	79	136	-	-	-	-
Boston Housing Auth.	-	41	-	41	-	-	-	41	-	-	-	-
School districts	-	13	-	13	-	-	-	13	-	-	-	-
Gardner Public Schools	-	13	-	13	-	-	-	13	-	-	-	-
Michigan	1,288	2,508	843	1,273	173	203	347	553	323	518	445	1,235
Municipalities	990	1,931	545	946	-	-	222	428	323	518	445	985
Detroit	767	1,503	323	518	-	-	-	-	323	518	445	985
Lansing	222	428	222	428	-	-	222	428	-	-	-	-
Counties	298	578	298	328	173	203	125	125	-	-	-	250
Wayne	173	453	173	203	173	203	-	-	-	-	-	250
Genessee	125	125	125	125	-	-	125	125	-	-	-	-
Minnesota	1,171	1,578	656	1,268	40	48	200	261	415	959	515	310
Municipalities	461	641	461	641	-	-	200	255	261	386	-	-
Minneapolis	261	386	261	386	-	-	-	-	261	386	-	-
Duluth	200	255	200	255	-	-	200	255	-	-	-	-
Counties	40	452	40	452	40	48	-	1	-	403	-	-
Hennepin	-	403	-	403	-	-	-	-	-	403	-	-
Ramsey	40	49	40	49	40	48	-	1	-	-	-	-
Special districts	670	485	154	175	-	-	-	5	154	170	515	310
Minneapolis-St. Paul Sanitary District	670	485	154	175	-	-	-	5	154	170	515	310
Missouri	266	211	266	211	-	-	257	61	10	151	-	-
Municipalities	143	151	143	151	-	-	143	-	-	151	-	-
St. Louis	143	151	143	151	-	-	143	-	-	151	-	-
Counties	107	61	107	61	-	-	97	61	10	-	-	-
St. Louis	107	61	107	61	-	-	97	61	10	-	-	-
Special districts	17	-	17	-	-	-	17	-	-	-	-	-
Metropolitan-St. Louis Sewer District	17	-	17	-	-	-	17	-	-	-	-	-
Nebraska	-	3	-	3	-	-	-	3	-	-	-	-
School districts	-	3	-	3	-	-	-	3	-	-	-	-
Lincoln School District	-	3	-	3	-	-	-	3	-	-	-	-
Nevada	137	184	137	184	-	-	137	144	-	40	-	-
School districts	137	184	137	184	-	-	137	144	-	40	-	-
Clark Co. School District	137	184	137	184	-	-	137	144	-	40	-	-

Table B-1. Local Government Expenditures for Research, Development, and R&D Plant, by State, Type and Individual Local Government, and Character of Work, Fiscal Years 1968 and 1969—Continued

[Thousands of dollars]

State, type and individual government	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Texas	951	2,432	868	2,703	179	273	348	461	320	2,056	103	634
Municipalities	170	1,170	170	521	-	-	37	190	133	325	-	537
Dallas	-	554	-	19	-	-	-	-	-	19	-	535
Wichita Falls	106	289	106	289	-	-	1	160	103	129	-	-
Austin	12	156	12	117	-	-	-	-	12	117	-	40
Fort Worth	56	110	56	97	-	-	36	36	20	61	-	13
School districts	282	790	268	790	-	-	201	156	67	634	14	-
Edgewood Ind. School District	-	418	-	418	-	-	-	-	-	418	-	-
Austin Ind. School District	67	290	67	290	-	-	-	156	67	134	-	-
Dallas Ind. School District	-	82	-	82	-	-	-	-	-	82	-	-
Houston Ind. School District	215	-	201	-	-	-	201	-	-	-	14	-
Hospital districts	497	1,533	407	1,460	179	273	110	109	118	1,099	89	51
Bexar Co. Hospital District	74	1,094	74	1,094	74	170	-	-	-	924	-	-
Dallas Co. Hospital District	422	439	333	366	105	104	110	109	118	175	89	51
Utah	29	142	29	142	-	-	29	124	-	17	-	-
Municipalities	-	137	-	137	-	-	-	119	-	17	-	-
Salt Lake City	-	137	-	137	-	-	-	119	-	17	-	-
Counties	29	5	29	5	-	-	29	5	-	-	-	-
Salt Lake	29	5	29	5	-	-	29	5	-	-	-	-
Virginia	734	741	718	724	-	-	174	191	543	533	16	17
Municipalities	22	33	22	33	-	-	22	33	-	-	-	-
Richmond	22	20	22	20	-	-	22	20	-	-	-	-
Norfolk	-	13	-	13	-	-	-	13	-	-	-	-
Counties	712	708	696	691	-	-	152	158	543	533	16	17
Fairfax	712	708	696	691	-	-	152	158	543	533	16	17
Washington	254	513	253	513	109	139	67	134	84	240	1	1
Municipalities	178	243	178	243	-	-	21	73	84	170	-	-
Seattle	87	235	87	235	-	-	4	65	84	170	-	-
Spokane	17	8	17	8	-	-	17	8	-	-	-	-
Counties	66	99	63	98	45	45	18	49	-	5	1	1
King	66	99	63	98	45	45	18	49	-	5	1	1
Special districts	84	169	84	169	58	94	26	10	-	65	-	-
Public Utility District 1 of Cowlitz County	84	94	84	94	58	94	26	-	-	-	-	-
Grays Harbor Co. Public Utility District 1	-	65	-	65	-	-	-	-	-	65	-	-
Benton Co. Public Utility District 1	-	10	-	10	-	-	-	10	-	-	-	-
School districts	2	2	2	2	-	-	2	2	-	-	-	-
Tacoma School District 10	2	2	2	2	-	-	2	2	-	-	-	-
Wisconsin	826	811	826	811	35	26	213	289	358	497	-	-
Municipalities	416	555	416	555	35	26	22	32	358	497	-	-
Milwaukee	326	465	326	465	35	26	22	32	268	407	-	-
Madison	90	90	90	90	-	-	-	-	90	90	-	-
School districts	190	256	190	256	-	-	190	256	-	-	-	-
Milwaukee City School District	172	229	172	228	-	-	172	228	-	-	-	-
Racine Unified School District 1	18	29	18	29	-	-	18	29	-	-	-	-

Table B-2. Local Government Expenditures for Research and Development, by Type of Local Government and Source of Funds, Fiscal Years 1968 and 1969

[Thousands of dollars]

Type of government	Total		Local governments		State government		Federal Government		Other[a]	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	29,431	39,688	12,013	15,925	1,249	4,265	15,482	18,377	687	1,122
Municipalities	15,104	20,963	6,174	8,182	322	2,323	8,094	9,641	514	816
Counties	9,565	9,053	3,440	4,483	238	776	3,837	3,712	51	103
Special districts	3,237	3,610	1,719	1,933	429	146	1,041	1,442	47	82
School districts	2,376	3,219	301	660	230	268	1,845	2,275	1	16
Hospital districts	918	2,424	293	527	31	746	526	1,057	68	94
Townships	231	407	86	140	-	7	139	250	6	11

[a] Includes only grants, reimbursements, or cost-sharing amounts provided by foundations, business firms, universities and colleges, or other outside sources.

Table B-3. Fifty Local Governments Leading in Research and Development Expenditures, by Type and Individual Local Government, and Source of Funds, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type and individual government[a]	Total		Local governments		State government		Federal Government		Other[b]	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	29,431	39,688	12,013	15,925	1,249	4,265	15,482	18,377	687	1,122
Municipalities	15,104	20,963	6,174	8,182	322	2,323	8,094	9,641	514	816
New York City, N.Y.	4,671	5,450	3,062	3,619	5	85	1,556	1,697	49	50
Boston, Mass.	840	2,628	30	52	-	1,835	810	742	-	-
Philadelphia, Pa.	2,306	2,432	142	178	51	73	1,795	1,737	318	444
Los Angeles, Calif.	1,692	1,718	1,297	1,427	-	-	395	149	(c)	142
Baltimore, Md.	755	1,147	132	170	90	110	497	834	36	33
Chicago, Ill.	836	1,103	104	91	92	138	612	834	29	41
San Francisco, Calif.	371	648	220	487	-	-	151	161	-	-
Detroit, Mich.	323	518	194	363	11	21	117	134	-	-
San Jose, Calif.	124	512	95	258	-	-	29	241	-	13
Dist. of Columbia	825	476	-	-	-	-	823	474	3	2
Milwaukee, Wis.	326	465	110	128	-	-	206	325	10	12
Lansing, Mich.	222	428	39	69	23	23	155	330	5	5
Hartford, Conn.	361	422	116	283	-	-	245	139	-	-
Jacksonville, Fla.	251	417	68	113	-	-	160	265	23	39
Minneapolis, Minn.	261	386	96	32	-	-	166	354	-	-
Wichita Falls, Tex.	104	289	36	114	-	-	68	175	-	-
Duluth, Minn.	200	255	45	75	50	25	105	155	-	-
Seattle, Wash.	87	235	87	235	-	-	-	-	-	-
All other	549	1,435	301	489	-	15	207	899	42	35
Counties	7,565	9,073	3,440	4,483	238	776	3,837	3,712	51	103
Los Angeles Co., Calif.	1,754	2,400	1,288	1,958	69	358	398	484	-	-
Cook Co., Ill.	2,185	2,055	979	942	15	35	1,191	1,078	-	-
Nassau Co., N.Y.	695	853	474	697	2	25	218	107	2	24
Fairfax Co., Va.	696	691	205	241	80	114	410	336	-	-
Dade Co., Fla.	247	407	72	152	-	-	175	252	-	3
Hennepin Co., Minn.	-	403	-	248	-	128	-	9	-	18
Anne Arundel Co., Md.	344	265	6	10	-	-	338	252	-	3
Santa Clara Co., Calif.	236	242	57	60	25	25	154	157	-	-
Essex Co., N.J.	10	208	10	76	-	-	-	132	-	-
Wayne Co., Mich.	173	203	125	132	-	-	48	71	-	-
Montgomery Co., Md.	221	159	26	33	9	11	187	115	-	-
All other	1,004	1,188	193	331	39	80	719	719	49	54
Special districts	3,237	3,603	1,719	1,933	429	146	1,041	1,442	47	82
Chicago, Ill. Transit Auth.	337	801	278	430	-	-	52	345	7	25
Met. Sanitary Dist. of Greater Chicago, Ill.	305	481	61	250	-	-	244	230	-	-
Allegheny Co., Pa. Port Auth.	866	318	265	156	429	81	151	57	22	23
Los Angeles Co., Calif. Sanitation Dist.	190	295	60	79	-	-	130	216	-	-
Met. Water Dist. of Southern Calif.	312	210	312	210	-	-	-	-	-	-
Alameda-Contra Costa, Calif. Transit Dist.	-	192	-	59	-	-	-	131	-	1
Minn.-St. Paul Sanitary Dist.	154	175	154	175	-	-	-	-	-	-
All other	1,071	1,131	589	571	-	65	464	463	18	32
School districts	2,376	3,219	301	660	230	268	1,845	2,275	1	16
Edgewood Tex. Ind. Sch. Dist.	-	418	-	-	-	-	-	418	-	-
Austin, Tex. Ind. Sch. Dist.	67	290	1	7	-	-	67	283	-	-
Columbus City, Ohio Sch. Dist.	-	264	-	113	-	51	-	84	-	16
Toledo City, Ohio Sch. Dist.	88	243	-	-	-	-	88	243	-	-
Milwaukee City, Wis. Sch. Dist.	172	228	-	-	-	-	172	228	-	-
Broward Co., Fla. Bd. of Pub. Inst.	104	208	66	84	13	5	25	119	-	-
Denver City-Co., Colo. Sch. Dist. 1	261	196	-	-	-	-	261	196	-	-
San Jose City, Calif. Unif. Sch. Dist.	205	193	-	-	205	193	-	-	-	-
Clark Co., Nev. Sch. Dist.	137	184	81	174	-	-	56	10	-	-
Cincinnati City, Ohio Sch. Dist.	320	184	59	68	-	10	261	106	-	-
All other	1,023	810	95	214	12	9	915	587	1	-
Hospital districts and townships	1,149	2,831	379	667	31	753	665	1,306	74	105
Bexar Co., Tex. Hosp. Dist.	74	1,094	28	342	-	208	47	543	-	-
Marion Co., Ind. Health and Hosp. Corp.	436	869	259	173	18	516	92	86	67	93
Dallas Co., Tex. Hosp. Dist.	333	388	-	-	-	-	333	388	-	-
Hempstead twp. N.Y.	223	317	79	105	-	-	139	201	6	11
All other	81	163	14	46	13	28	54	87	1	1

[a] Listed according to total R&D expenditures for fiscal year 1969.

[b] Includes only grants, reimbursements, or cost-sharing amounts provided by foundations, business firms, universities and colleges, or other outside sources.

[c] Less than $500.

Table B-4. Local Government Expenditures for R&D Plant, by Type of Local Government and Source of Funds, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Local governments		State government		Federal Government		Other[a]	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	2,025	7,151	1,492	5,494	24	19	488	1,498	20	140
Municipalities	972	5,514	719	4,187	7	9	226	1,178	20	140
Counties	204	970	192	726	6	6	6	238	-	-
Special districts	701	604	554	573	-	-	146	31	-	-
School districts	48	9	20	5	11	4	17	-	-	-
Hospital districts	93	51	-	-	-	-	93	51	-	-
Townships	7	3	7	3	-	-	-	-	-	-

[a] Includes only grants, reimbursements, or cost-sharing amounts provided by foundations, business firms, universities and colleges, or other outside sources.

Table B-5. Local Government Expenditures for Research and Development, by Type of Local Government and Functional Area, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Health and hospitals		Education		Sanitation		Police and correction		Municipal utilities	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	29,431	39,688	10,725	15,506	4,455	5,042	1,999	4,802	4,163	4,408	3,695	3,394
Municipalities	15,104	20,963	5,394	7,775	947	781	902	3,579	3,506	3,261	1,175	1,089
Counties	7,565	9,073	4,259	5,108	1,131	1,043	457	295	645	942	288	372
Special districts	3,237	3,603	154	175	-	-	640	928	-	192	2,098	1,846
School districts	2,376	3,219	-	-	2,376	3,219	-	-	-	-	-	-
Hospital districts	918	2,424	918	2,424	-	-	-	-	-	-	-	-
Townships	231	407	-	24	-	-	-	-	12	12	134	88

Type of government	Financial administration and general control		Housing and urban renewal		Natural resources		Highways		Public welfare		Other	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	1,880	2,619	472	1,738	814	707	47	120	85	73	1,096	1,280
Municipalities	1,496	2,050	357	1,122	505	263	40	116	-	-	782	927
Counties	277	476	78	456	112	150	-	-	85	73	233	160
Special districts	108	93	-	42	156	196	-	-	-	-	81	131
School districts	-	-	-	-	-	-	-	-	-	-	-	-
Hospital districts	-	-	-	-	-	-	-	-	-	-	-	-
Townships	-	-	37	119	41	98	7	3	-	-	-	62

Table B-6. Fifty Local Governments Leading in Research and Development Expenditures, by Type and Individual Local Government, and Functional Area, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type and individual government[a]	Total		Health and hospitals		Education		Sanitation		Police and correction		Municipal utilities	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	29,431	39,688	10,725	15,506	4,455	5,042	1,999	4,802	4,163	4,408	3,695	3,394
Municipalities	15,104	20,963	5,394	7,775	947	781	902	3,579	3,506	3,261	1,175	1,089
New York City, N.Y.	4,671	5,450	91	288	625	154	1	1,875	2,408	2,109	744	287
Boston, Mass.	840	2,628	735	2,453	-	-	-	-	-	-	-	-
Philadelphia, Pa.	2,306	2,432	2,129	2,164	-	6	6	7	-	-	41	113
Los Angeles, Calif.	1,692	1,718	-	24	-	-	221	303	830	741	104	130
Baltimore, Md.	755	1,147	523	738	-	-	-	91	8	23	100	118
Chicago, Ill.	836	1,103	429	739	9	12	-	-	141	212	-	-
San Francisco, Calif.	371	648	240	308	-	-	131	340	-	-	-	-
Detroit, Mich.	323	518	11	21	-	-	235	319	-	-	77	178
San Jose, Calif.	124	512	-	-	-	-	4	30	120	157	-	-
Dist. of Columbia	825	476	514	2	311	474	-	-	-	-	-	-
Milwaukee, Wis.	326	465	293	421	-	-	-	-	-	-	-	-
Lansing, Mich.	222	428	-	-	-	-	-	-	-	-	-	-
Hartford, Conn.	361	422	361	417	-	-	-	5	-	-	-	-
Jacksonville, Fla.	251	417	45	78	-	-	-	105	-	-	-	-
Minneapolis, Minn.	261	386	-	-	-	-	-	-	-	-	-	-
Witchita Falls, Tex.	104	289	-	-	-	-	103	129	-	-	-	-
Duluth, Minn.	200	255	-	-	-	-	-	-	-	-	-	-
Seattle, Wash.	87	235	-	-	-	-	-	-	-	-	87	228
All other	549	1,435	22	122	3	135	203	375	-	18	22	35
Counties	7,565	9,073	4,259	5,108	1,131	1,043	457	295	645	942	288	372
Los Angeles Co., Calif.	1,754	2,400	488	824	-	-	439	192	474	712	-	-
Cook Co., Ill.	2,185	2,055	2,185	2,055	-	-	-	-	-	-	-	-
Nassau Co., N.Y.	695	853	427	608	-	-	-	-	-	-	268	245
Fairfax Co., Va.	696	691	-	-	696	691	-	-	-	-	-	-
Dade Co., Fla.	247	407	-	-	-	-	-	-	-	21	-	127
Hennepin Co., Minn.	-	403	-	373	-	-	-	-	-	29	-	-
Anne Arundel Co., Md.	344	265	-	-	344	265	-	-	-	-	-	-
Santa Clara Co., Calif.	236	242	-	-	-	-	-	-	171	174	-	-
Essex Co., N. J.	10	208	10	10	-	-	-	-	-	-	-	-
Wayne Co., Mich.	173	203	173	203	-	-	-	-	-	-	-	-
Montgomery Co., Md.	221	159	221	159	-	-	-	-	-	-	-	-
All other	1,004	1,188	755	876	91	87	19	103	-	5	20	-
Special districts	3,237	3,603	154	175	-	-	640	928	-	192	2,098	1,846
Chicago, Ill. Transit Auth.	337	801	-	-	-	-	-	-	-	-	337	801
Met. Sanitary Dist. of Greater Chicago, Ill.	305	481	-	-	-	-	305	481	-	-	-	-
Allegheny Co., Pa. Port Auth.	866	318	-	-	-	-	-	-	-	-	866	318
Los Angeles Co., Calif. Sanitation Dist.	190	295	-	-	-	-	190	295	-	-	-	-
Met. Water Dist. of Southern Calif.	312	210	-	-	-	-	-	-	-	-	312	210
Alameda-Contra Costa, Calif. Transit Dist.		192	-	-	-	-	-	-	-	192	-	-
Minn.-St. Paul Sanitary Dist.	154	175	154	175	-	-	-	-	-	-	-	-
All other	1,071	1,131	-	-	-	-	145	152	-	-	582	518
School districts	2,376	3,219	-	-	2,376	3,219	-	-	-	-	-	-
Edgewood, Tex. Ind. Sch. Dist.	-	418	-	-	-	418	-	-	-	-	-	-
Austin, Tex. Ind. Sch. Dist.	67	290	-	-	67	290	-	-	-	-	-	-
Columbus City, Ohio Sch. Dist.	-	264	-	-	-	264	-	-	-	-	-	-
Toledo City, Ohio Sch. Dist.	88	243	-	-	88	243	-	-	-	-	-	-
Milwaukee City, Wis. Sch. Dist.	172	228	-	-	172	228	-	-	-	-	-	-
Broward Co., Fla. Bd. of Pub. Inst.	104	208	-	-	104	208	-	-	-	-	-	-
Denver City-Co., Colo. Sch. Dist. 1	261	196	-	-	261	196	-	-	-	-	-	-
San Jose City, Calif. Unif. Sch. Dist.	205	193	-	-	205	193	-	-	-	-	-	-
Clark Co., Nev. Sch. Dist.	137	184	-	-	137	184	-	-	-	-	-	-
Cincinnati City, Ohio Sch. Dist.	320	184	-	-	320	184	-	-	-	-	-	-
All other	1,023	810	-	-	1,023	810	-	-	-	-	-	-
Hospital districts and townships	1,149	2,831	918	2,448	-	-	-	-	12	12	134	88
Bexar Co., Tex. Hosp. Dist.	74	1,094	74	1,094	-	-	-	-	-	-	-	-
Marion Co., Ind. Health and Hosp. Corp.	436	869	436	869	-	-	-	-	-	-	-	-
Dallas Co., Tex. Hosp. Dist.	333	388	333	388	-	-	-	-	-	-	-	-
Hempstead twp., N.Y.	223	317	-	-	-	-	-	-	12	12	134	88
All other	81	163	74	98	-	-	-	-	-	-	-	-

See footnote at end of table.

Table B-6. Fifty Local Governments Leading in Research and Development Expenditures, by Type and Individual Local Government, and Functional Area, Fiscal Years 1968 and 1969—Continued

(Thousands of dollars)

Type and individual government[a]	Financial administration and general control		Housing and urban renewal		Natural resources		Highways		Public welfare		Other	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	1,880	2,619	472	1,738	814	707	47	120	85	73	1,096	1,280
Municipalities	1,496	2,050	357	1,122	505	263	40	116	-	-	782	927
New York City, N.Y.	90	198	81	203	331	-	3	3	-	-	297	333
Boston, Mass.	-	-	105	175	-	-	-	-	-	-	-	-
Philadelphia, Pa.	7	14	4	14	119	115	-	-	-	-	-	-
Los Angeles, Calif.	46	113	4	29	3	87	37	45	-	-	448	246
Baltimore, Md.	124	177	-	-	-	-	-	-	-	-	-	-
Chicago, Ill.	257	48	-	92	-	-	-	-	-	-	-	-
San Francisco, Calif.	-	-	-	-	-	-	-	-	-	-	-	-
Detroit, Mich.	-	-	-	-	-	-	-	-	-	-	-	-
San Jose, Calif.	-	-	1	326	-	-	-	-	-	-	-	-
Dist. of Columbia	-	-	-	-	-	-	-	-	-	-	-	-
Milwaukee, Wis.	-	-	-	-	32	44	-	-	-	-	-	-
Lansing, Mich.	222	313	-	-	-	-	-	-	-	-	-	115
Hartford, Conn.	-	-	-	-	-	-	-	-	-	-	-	-
Jacksonville, Fla.	205	233	-	-	-	-	-	-	-	-	-	-
Minneapolis, Minn.	261	386	-	-	-	-	-	-	-	-	-	-
Wichita Falls, Tex.	-	-	-	-	-	-	-	69	-	-	1	92
Duluth, Minn.	200	255	-	-	-	-	-	-	-	-	-	-
Seattle, Wash.	-	-	-	-	-	6	-	-	-	-	-	-
All other	83	313	162	283	19	11	-	-	-	-	35	141
Counties	277	476	78	456	112	150	-	-	85	73	233	160
Los Angeles Co., Calif.	204	204	44	357	85	111	-	-	20	-	-	-
Cook Co., Ill.	-	-	-	-	-	-	-	-	-	-	-	-
Nassau Co., N.Y.	-	-	-	-	-	-	-	-	-	-	-	-
Fairfax Co., Va.	-	-	-	-	-	-	-	-	-	-	-	-
Dade Co., Fla.	1	6	34	99	-	-	-	-	-	-	211	155
Hennepin Co., Minn.	-	-	-	-	-	-	-	-	-	-	-	-
Anne Arundel Co., Md.	-	-	-	-	-	-	-	-	-	-	-	-
Santa Clara Co., Calif.	-	-	-	-	-	-	-	-	65	68	-	-
Essex Co., N.J.	-	198	-	-	-	-	-	-	-	-	-	-
Wayne Co., Mich.	-	-	-	-	-	-	-	-	-	-	-	-
Montgomery Co., Md.	-	-	-	-	-	-	-	-	-	-	-	-
All other	72	69	-	-	27	39	-	-	-	5	21	5
Special districts	108	93	-	42	156	196	-	-	-	-	81	131
Chicago, Ill. Transit Auth.	-	-	-	-	-	-	-	-	-	-	-	-
Met. Sanitary Dist. of Greater Chicago, Ill.	-	-	-	-	-	-	-	-	-	-	-	-
Allegheny Co., Pa. Port Auth.	-	-	-	-	-	-	-	-	-	-	-	-
Los Angeles Co., Calif. Sanitation Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Met. Water Dist. of Southern Calif.	-	-	-	-	-	-	-	-	-	-	-	-
Alameda-Contra Costa, Calif. Transit Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Minn., St. Paul, Minn. Sanitary Dist.	-	-	-	-	-	-	-	-	-	-	-	-
All other	108	93	-	42	156	196	-	-	-	-	81	131
School districts	-	-	-	-	-	-	-	-	-	-	-	-
Edgewood, Tex. Ind. Sch. Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Austin, Tex. Ind. Sch. Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Columbus City, Ohio Sch. Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Toledo City, Ohio Sch. Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Milwaukee City, Wis. Sch. Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Broward Co., Fla. Bd. of Pub. Inst.	-	-	-	-	-	-	-	-	-	-	-	-
Denver City-Co., Colo. Sch. Dist. 1	-	-	-	-	-	-	-	-	-	-	-	-
San Jose City, Calif. Unif. Sch. Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Clark Co., Nev. Sch. Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Cincinnati City, Ohio Sch. Dist.	-	-	-	-	-	-	-	-	-	-	-	-
All other	-	-	-	-	-	-	-	-	-	-	-	-
Hospital districts and townships.	-	-	37	119	41	98	7	3	-	-	-	62
Bexar Co., Tex. Hosp Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Marion Co., Ind. Health and Hosp. Corp.	-	-	-	-	-	-	-	-	-	-	-	-
Dallas Co., Tex. Hosp. Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Hempstead twp., N.Y.	-	-	37	119	41	98	-	-	-	-	-	-
All other	-	-	-	-	-	-	7	3	-	-	-	62

[a] Listed according to total R&D expenditures for fiscal year 1969.

Table B-7. Local Government Expenditures for Basic Research, by Type of Local Government and Functional Area, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Health and hospitals		Education		Sanitation		Police and correction		Municipal utilities	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	6,400	6,742	5,999	6,162	-	60	11	37	257	258	-	-
Municipalities	3,363	3,577	3,077	3,189	-	60	11	37	257	258	-	-
Counties	2,655	2,632	2,617	2,549	-	-	-	-	-	-	-	-
Special districts	71	108	-	-	-	-	-	-	-	-	-	-
School districts	-	-	-	-	-	-	-	-	-	-	-	-
Hospital districts	304	424	304	424	-	-	-	-	-	-	-	-
Townships	7	-	-	-	-	-	-	-	-	-	-	-

Type of government	Financial administration and general control		Housing and urban renewal		Natural resources		Highways		Public welfare		Other	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	-	11	-	1	63	108	7	-	-	-	64	105
Municipalities	-	11	-	-	10	12	-	-	-	-	8	11
Counties	-	-	-	-	37	83	-	-	-	-	-	-
Special districts	-	-	-	1	15	13	-	-	-	-	55	94
School districts	-	-	-	-	-	-	-	-	-	-	-	-
Hospital districts	-	-	-	-	-	-	-	-	-	-	-	-
Townships	-	-	-	-	-	-	7	-	-	-	-	-

Table B-8. Local Government Expenditures for Applied Research, by Type of Local Government and Functional Area, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Health and hospitals		Education		Sanitation		Police and correction		Municipal utilities	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	12,656	15,474	3,571	4,602	1,935	2,392	1,133	1,508	888	1,554	2,379	1,932
Municipalities	5,531	6,340	1,854	1,944	65	103	217	570	402	611	911	621
Counties	2,890	3,793	1,234	1,750	238	245	276	166	474	739	288	372
Special districts	1,914	2,102	-	5	-	-	640	772	-	192	1,046	852
School districts	1,631	2,045	-	-	1,631	2,045	-	-	-	-	-	-
Hospital districts	483	879	483	879	-	-	-	-	-	-	-	-
Townships	207	315	-	24	-	-	-	-	12	12	134	88

Type of government	Financial administration and general control		Housing and urban renewal		Natural resources		Highways		Public welfare		Other	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	846	1,386	340	728	697	498	12	87	20	-	835	786
Municipalities	738	1,107	269	469	486	243	12	84	-	-	576	588
Counties	33	219	34	99	60	44	-	-	20	-	233	160
Special districts	75	60	-	41	126	143	-	-	-	-	26	37
School districts	-	-	-	-	-	-	-	-	-	-	-	-
Hospital districts	-	-	-	-	-	-	-	-	-	-	-	-
Townships	-	-	37	119	25	69	-	3	-	-	-	-

Table B-9. Local Government Expenditures for Development, by Type of Local Government and Functional Area, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Health and hospitals		Education		Sanitation		Police and correction		Municipal utilities	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	10,375	17,473	1,155	4,742	2,520	2,590	856	3,257	3,019	2,596	1,316	1,462
Municipalities	6,210	11,045	463	2,642	882	619	675	2,972	2,848	2,392	265	468
Counties	2,020	2,648	407	808	893	798	181	129	171	204	-	-
Special districts	1,252	1,393	154	170	-	-	-	156	-	-	1,051	995
School districts	745	1,174	-	-	745	1,174	-	-	-	-	-	-
Hospital districts	131	1,121	131	1,121	-	-	-	-	-	-	-	-
Townships	16	91	-	-	-	-	-	-	-	-	-	-

Type of government	Financial administration and general control		Housing and urban renewal		Natural resources		Highways		Public welfare		Other	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	1,034	1,222	132	1,009	54	101	28	33	65	73	197	389
Municipalities	757	933	88	652	9	9	28	33	-	-	197	327
Counties	244	257	44	357	15	24	-	-	65	73	-	-
Special districts	33	33	-	-	14	40	-	-	-	-	-	-
School districts	-	-	-	-	-	-	-	-	-	-	-	-
Hospital districts	-	-	-	-	-	-	-	-	-	-	-	-
Townships	-	-	-	-	16	29	-	-	-	-	-	62

Table B-10. Local Government Expenditures for Medical and Health-Related Research, Development, and R&D Plant, by Type of Local Government and Character of Work, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	15,654	27,358	14,042	22,221	6,013	6,228	5,958	7,132	2,072	8,860	1,61[illegible]	5,137
Municipalities	7,590	15,667	6,917	12,070	3,081	3,210	2,698	2,874	1,139	5,986	673	3,598
Counties	5,032	6,827	4,866	5,919	2,628	2,593	1,606	2,027	632	1,299	167	908
Special districts	1,885	2,001	1,210	1,421	-	1	1,055	1,021	155	398	676	580
School districts	84	209	81	209	-	-	66	153	15	56	3	-
Hospital districts	1,011	2,475	918	2,424	304	424	483	879	131	1,121	93	51
Townships	50	178	50	178	-	-	50	178	-	-	-	-

Table B-11. Local Government Expenditures for Medical and Health-Related Research, Development, and R&D Plant, by Type of Local Government and Functional Area, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Health and hospitals		Education		Sanitation		Police and correction		Municipal utilities	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	15,654	27,358	11,634	16,370	84	209	2,301	8,498	70	100	731	723
Municipalities	7,590	15,667	5,581	7,856	-	-	1,115	6,637	70	100	186	304
Counties	5,032	6,827	4,372	5,530	-	-	507	777	-	-	20	-
Special districts	1,885	2,001	670	485	-	-	679	1,084	-	-	525	419
School districts	84	209	-	-	84	209	-	-	-	-	-	-
Hospital districts	1,011	2,475	1,011	2,475	-	-	-	-	-	-	-	-
Townships	50	178	-	24	-	-	-	-	-	-	-	-

Type of government	Financial administration and general control		Housing and urban renewal		Natural resources		Highway		Public welfare		Other	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	242	368	117	904	413	147	-	-	20	-	43	38
Municipalities	242	368	2	328	374	48	-	-	-	-	21	26
Counties	-	-	78	456	14	52	-	-	20	-	22	12
Special districts	-	-	-	1	12	12	-	-	-	-	-	-
School districts	-	-	-	-	-	-	-	-	-	-	-	-
Hospital districts	-	-	-	-	-	-	-	-	-	-	-	-
Townships	-	-	37	119	13	35	-	-	-	-	-	-

Table B-12. Local Government Expenditures for Research, Development, and R&D Plant, by State and Character of Work, Fiscal Years 1968 and 1969

(Thousands of dollars)

State	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	31,455	46,840	29,431	39,688	6,400	6,742	12,656	15,474	10,375	17,473	2,025	7,151
Alabama	-	-	-	-	-	-	-	-	-	-	-	-
Alaska	-	-	-	-	-	-	-	-	-	-	-	-
Arizona	169	298	165	295	-	-	129	163	36	132	3	4
Arkansas	8	20	8	20	-	-	8	20	-	-	-	-
California	6,580	8,778	5,988	6,950	142	239	3,579	3,869	2,268	2,841	591	1,827
Colorado	285	508	265	366	-	-	265	318	-	48	20	142
Connecticut	361	422	361	422	-	-	361	422	-	-	-	-
Delaware	-	-	-	-	-	-	-	-	-	-	-	-
District of Columbia	879	611	879	611	-	-	562	50	317	562	-	-
Florida	932	1,285	932	1,285	-	-	617	965	315	318	-	-
Georgia	206	307	206	307	108	109	42	137	57	61	-	-
Hawaii	-	-	-	-	-	-	-	-	-	-	-	-
Idaho[a]	-	-	-	-	-	-	-	-	-	-	-	-
Illinois	3,716	4,589	3,663	4,449	2,506	2,452	563	904	595	1,094	53	140
Indiana	485	959	485	959	100	124	361	801	25	34	-	-
Iowa	-	9	-	6	-	-	-	6	-	-	-	3
Kansas	42	41	42	41	-	-	27	35	15	6	-	-
Kentucky	7	132	7	131	-	-	7	131	-	-	-	1
Louisiana	7	12	7	12	-	-	7	12	-	-	-	-
Maine	-	-	-	-	-	-	-	-	-	-	-	-
Maryland	1,553	1,794	1,525	1,761	298	269	367	750	861	742	27	33
Massachusetts	922	2,834	922	2,834	227	303	695	698	-	1,833	-	-
Michigan	1,288	2,508	843	1,273	173	203	347	553	323	518	445	1,235
Minnesota	1,171	1,578	656	1,268	40	48	200	261	415	959	515	310
Mississippi	-	-	-	-	-	-	-	-	-	-	-	-
Missouri	266	211	266	211	-	-	257	61	10	151	-	-
Montana[a]	-	-	-	-	-	-	-	-	-	-	-	-
Nebraska	-	3	-	3	-	-	-	3	-	-	-	-
Nevada	137	184	137	184	-	-	137	144	-	40	-	-
New Hampshire	-	-	-	-	-	-	-	-	-	-	-	-
New Jersey	39	477	32	474	7	-	10	306	15	168	7	3
New Mexico	23	53	23	53	-	-	-	-	23	53	-	-
New York	5,961	9,477	5,749	6,763	359	366	2,566	2,427	2,824	3,970	212	2,714
North Carolina	-	119	-	119	-	-	-	-	-	119	-	-
North Dakota[a]	-	-	-	-	-	-	-	-	-	-	-	-
Ohio	564	805	555	794	2	11	289	698	263	85	9	10
Oklahoma	-	35	-	35	-	-	-	35	-	-	-	-
Oregon	42	125	42	125	-	-	2	72	40	53	-	-
Pennsylvania	3,194	2,822	3,172	2,750	2,121	2,119	383	341	668	289	22	73
Rhode Island	-	-	-	-	-	-	-	-	-	-	-	-
South Carolina	-	-	-	-	-	-	-	-	-	-	-	-
South Dakota[a]	-	-	-	-	-	-	-	-	-	-	-	-
Tennessee	46	208	46	208	-	61	46	96	-	51	-	-
Texas	951	3,432	848	2,793	179	273	348	461	320	2,058	103	638
Utah	29	142	29	142	-	-	29	124	-	17	-	-
Vermont[a]	-	-	-	-	-	-	-	-	-	-	-	-
Virginia	734	741	718	724	-	-	174	191	543	533	16	17
Washington	254	513	253	513	103	139	67	134	84	240	1	1
West Virginia	-	-	-	-	-	-	-	-	-	-	-	-
Wisconsin	606	811	606	811	35	26	213	289	358	497	-	-
Wyoming[a]	-	-	-	-	-	-	-	-	-	-	-	-

[a] Not included in survey because the governmental units did not meet the specifications established for coverage in this survey. See Technical Notes.

Table B-13. Local Government Expenditures for Research, Development, and R&D Plant, by Type of Local Goverment and Character of Work, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total.....	31,455	46,840	29,431	39,688	6,400	6,742	12,656	15,474	10,375	17,473	2,025	7,151
Municipalities.....	16,077	26,477	15,104	20,963	3,363	3,577	5,531	6,340	6,210	11,045	972	5,514
Counties.....	7,769	10,043	7,565	9,073	2,655	2,632	2,890	3,793	2,020	2,648	204	970
Special districts.....	3,937	4,207	3,237	3,603	71	108	1,914	2,102	1,252	1,393	701	604
School districts.....	2,424	3,228	2,376	3,219	-	-	1,631	2,045	745	1,174	48	9
Hospital districts.....	1,011	2,475	918	2,424	304	424	483	879	131	1,121	93	51
Townships.....	238	410	231	407	7	-	207	315	16	91	7	3

Table B-14. Local Government Expenditures for Research, Development, and R&D Plant, by Type and Individual Local Government, and Character of Work, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type and individual government[a]	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	31,455	46,840	29,431	39,688	6,400	6,742	12,656	15,474	10,375	17,473	2,025	7,151
Municipalities	16,077	26,477	15,104	20,963	3,363	3,577	5,531	6,340	6,210	11,045	972	5,514
New York City, N.Y.	4,804	8,009	4,671	5,450	343	351	1,572	1,209	2,757	3,890	133	2,559
Boston, Mass.	840	2,628	840	2,628	227	303	613	492	-	1,833	-	-
Philadelphia, Pa.	2,328	2,505	2,306	2,432	2,121	2,119	163	263	22	50	22	73
Los Angeles, Calif.	1,958	2,383	1,692	1,718	13	24	741	768	938	926	266	666
Detroit, Mich.	767	1,503	323	518	-	-	-	-	323	518	445	985
Baltimore, Md.	771	1,170	755	1,147	298	269	160	548	298	329	16	24
San Francisco, Calif.	386	1,117	371	648	-	-	240	376	131	272	15	469
Chicago, Ill.	836	1,103	836	1,103	321	397	15	250	501	456	-	-
Dallas, Tex.	-	554	-	19	-	-	-	-	-	19	-	535
San Jose, Calif.	172	512	124	512	4	17	76	84	45	412	48	-
District of Columbia	825	476	825	476	-	-	562	50	263	426	-	-
Milwaukee, Wis.	326	465	326	465	35	26	22	32	268	407	-	-
Lansing, Mich.	222	428	222	428	-	-	222	428	-	-	-	-
Hartford, Conn.	361	422	361	422	-	-	361	422	-	-	-	-
Jacksonville, Fla.	251	417	251	417	-	-	251	417	-	-	-	-
Minneapolis, Minn.	261	386	261	386	-	-	-	-	261	386	-	-
Wichita Falls, Tex.	104	289	104	289	-	-	1	160	103	129	-	-
Duluth, Minn.	200	255	200	255	-	-	200	255	-	-	-	-
Denver, Colo.	24	244	4	102	-	-	4	54	-	48	20	142
Seattle, Wash.	87	235	87	235	-	-	4	65	84	170	-	-
Austin, Tex.	12	156	12	117	-	-	-	-	12	117	-	40
St. Louis, Mo.	143	151	143	151	-	-	143	-	-	151	-	-
Salt Lake City, Utah	-	137	-	137	-	-	-	119	-	17	-	-
Charlotte, N.C.	-	119	-	119	-	-	-	-	-	119	-	-
Chattanooga, Tenn.	-	111	-	111	-	60	-	-	-	51	-	-
Fort Worth, Tex.	56	110	56	97	-	-	36	36	20	61	-	13
Madison, Wis.	90	90	90	90	-	-	-	-	90	90	-	-
Scottsdale, Ariz.	35	70	35	70	-	-	-	-	35	70	-	-
Atlanta, Ga.	-	67	-	67	-	-	-	67	-	-	-	-
Gary, Ind.	18	55	18	55	-	-	18	55	-	-	-	-
Albuquerque, N. Mex.	23	53	23	53	-	-	-	-	23	53	-	-
San Diego, Calif.	32	41	32	41	-	-	32	41	-	-	-	-
Dayton, Ohio	48	29	42	22	-	-	31	11	10	11	6	7
Savannah, Ga.	27	26	27	26	-	-	-	-	27	26	-	-
Oakland, Calif.	-	23	-	23	-	-	-	18	-	5	-	-
Long Beach, Calif.	22	20	20	20	-	-	20	20	-	-	2	(b)
Richmond, Va.	22	20	22	20	-	-	22	20	-	-	-	-
Youngstown, Ohio	3	16	3	16	2	11	-	-	1	5	-	-
Louisville, Ky.	-	14	-	14	-	-	-	14	-	-	-	-
Norfolk, Va.	-	13	-	13	-	-	-	13	-	-	-	-
Quincy, Mass.	3	12	3	12	-	-	3	12	-	-	-	-
Wichita, Kans.	2	10	2	10	-	-	2	10	-	-	-	-
Ames, Iowa	-	9	-	6	-	-	-	6	-	-	-	3
Memphis, Tenn.	-	9	-	9	-	1	-	8	-	-	-	-
Spokane, Wash.	17	8	17	8	-	-	17	8	-	-	-	-
Tampa, Fla.	-	5	-	5	-	-	-	5	-	-	-	-
Springfield, Mass.	-	5	-	5	-	-	-	5	-	-	-	-
Counties	7,769	10,043	7,565	9,073	2,655	2,632	2,890	3,793	2,020	2,648	204	970
Los Angeles Co., Calif.	1,851	2,938	1,754	2,400	45	71	1,136	1,486	573	843	97	537
Cook Co., Ill.	2,185	2,055	2,185	2,055	2,185	2,055	-	-	-	-	-	-
Nassau Co., N.Y.	771	1,005	695	853	16	15	679	838	-	-	76	152
Fairfax Co., Va.	712	708	696	691	-	-	152	158	543	533	16	17
Wayne Co., Mich.	173	453	173	203	173	203	-	-	-	-	-	250
Dade Co., Fla.	247	407	247	407	-	-	247	407	-	-	-	-
Hennepin Co., Minn.	-	403	-	403	-	-	-	-	-	403	-	-
Anne Arundel Co., Md.	356	274	344	265	-	-	-	-	344	265	11	10
Santa Clara Co., Calif.	236	242	236	242	-	-	-	-	236	242	-	-
Essex Co., N.J.	10	208	10	208	-	-	10	208	-	-	-	-
Montgomery Co., Md.	221	159	221	159	-	-	34	44	187	115	-	-
Westchester Co., N.Y.	163	146	160	143	-	-	109	92	51	51	3	3
Genesee Co., Mich.	125	125	125	125	-	-	125	125	-	-	-	-
Bergen Co., N.J.	-	111	-	111	-	-	-	70	-	41	-	-
King Co., Wash.	64	99	63	98	45	45	18	49	-	5	1	1

See footnotes at end of table.

Table B-14. **Local Government Expenditures for Research, Development, and R&D Plant, by Type and Individual Local Government, and Character of Work, Fiscal Years 1968 and 1969**--Continued

(Thousands of dollars)

Type and individual government[a]	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Counties--Continued.....												
Shelby Co., Tenn.....	46	88	46	88	-	-	46	88	-	-	-	-
Prince Georges Co., Md.....	86	87	86	87	-	-	86	87	-	-	-	-
Evans Co., Ga.....	86	86	86	86	86	86	-	-	-	-	-	-
Monmouth Co., N.J.....	15	65	15	65	-	-	-	-	15	65	-	-
St. Louis Co., Mo.....	107	61	107	61	-	-	97	61	10	-	-	-
Multnomah Co., Ore.....	42	53	42	53	-	-	2	-	40	53	-	-
Ramsey Co., Minn.....	40	49	40	49	40	48	-	1	-	-	-	-
San Mateo Co., Calif.....	12	49	12	49	-	34	12	15	-	-	-	-
San Bernardino Co., Calif.....	27	39	27	39	27	39	-	-	-	-	-	-
San Diego Co., Calif.....	37	37	37	37	37	37	-	-	-	-	-	-
Bartholomew Co., Ind.....	32	36	32	36	-	-	16	18	16	18	-	-
Tulsa Co., Okla.....	-	35	-	35	-	-	-	35	-	-	-	-
Pima Co., Ariz.....	1	12	1	12	-	-	-	-	1	12	-	-
Cuyahoga Co., Ohio.....	30	7	30	7	-	-	30	7	-	-	-	-
Salt Lake Co., Utah.....	29	5	29	5	-	-	29	5	-	-	-	-
Orange Co., Fla.....	4	3	4	3	-	-	-	-	4	3	-	-
Alameda Co., Calif.....	43	-	43	-	-	-	43	-	-	-	-	-
Fresno Co., Calif.....	20	-	20	-	-	-	20	-	-	-	-	-
Special districts.....	3,937	4,207	3,237	3,603	71	108	1,914	2,102	1,252	1,393	701	604
Chicago, Ill. Transit Auth.....	337	801	337	801	-	-	243	319	94	482	-	-
Met. Sanitary Dist. of Greater Chicago, Ill.....	358	571	305	481	-	-	305	335	-	144	53	90
Minn.-St. Paul Sanitary District.....	670	485	154	175	-	-	-	5	154	170	515	310
Los Angeles Co., Calif Sanitation Dist.....	190	319	190	295	-	-	190	295	-	-	-	24
Allegheny Co., Pa. Port Auth.....	866	318	866	318	-	-	220	78	646	240	-	-
Met. Water Dist. of Southern Calif.....	333	219	312	210	-	-	300	138	13	72	20	9
Orange Co., Calif. Water Dist....	220	208	120	108	-	-	120	108	-	-	100	100
Alameda-Contra Costa, Calif. Transit Dist.....	-	192	-	192	-	-	-	192	-	-	-	-
Central and S. Fla. Flood Control Dist.....	112	154	112	154	-	-	98	114	14	40	-	-
Mass. Bay Transit Auth.....	79	136	79	136	-	-	99	136	-	-	-	-
Washington, D.C. Met. Area Transit Comm.....	54	136	54	136	-	-	-	-	54	136	-	-
The Md. National Capital Park Planning Comm.....	119	104	119	104	-	-	87	72	33	33	-	-
Salt River, Ariz. Project Agricultural Imp. Power Dist....	61	94	58	91	-	-	58	91	-	-	3	4
Cowlitz Co., Wash. Public Utility Dist. 1.....	84	94	84	94	58	94	26	-	-	-	-	-
Grays Harbor Co., Wash. Public Utility Dist. 1.....	-	65	-	65	-	-	-	-	-	65	-	-
E. Calif. Mun. Water Dist.....	70	60	70	52	-	-	70	52	-	-	-	9
Greater Peoria, Ill. Sanitary Dist.....	-	60	-	10	-	-	-	-	-	10	-	50
Coachella Valley Co., Calif. Water Dist.....	66	49	66	49	-	-	66	49	-	-	-	-
Boston, Mass. Housing Auth.....	-	41	-	41	-	-	-	41	-	-	-	-
Port of Portland, Oreg.....	-	37	-	37	-	-	-	37	-	-	-	-
Imperial, Calif. Irrigation Dist.....	32	32	23	23	13	13	10	10	-	-	9	9
East Bay, Calif. Municipal Utility Dist.....	25	20	25	20	-	-	25	20	-	-	-	-
Benton Co., Wash. Public Utility Dist. 1.....	-	10	-	10	-	-	-	10	-	-	-	-
Housing Auth. of the City and Co. of San Francisco, Calif.....	-	1	-	1	-	1	-	-	-	-	-	-
Central Basin, Calif. Mun. Water Dist.....	(b)	(b)	(b)	(b)	-	-	-	-	(b)	(b)	-	-
San Francisco, Calif. Bay Area Rapid Transit Dist.....	244	-	244	-	-	-	-	-	244	-	-	-
Met. St. Louis, Mo. Sewer Dist...	17	-	17	-	-	-	17	-	-	-	-	-
W. Basin, Calif. Municipal Water Dist.....	(b)	-	(b)	-	-	-	-	-	(b)	-	-	-

See footnotes at end of table.

Table B-14. Local Government Expenditures for Research, Development, and R&D Plant, by Type and Individual Local Government, and Character of Work, Fiscal Years 1968 and 1969—Continued

(Thousands of dollars)

Type and individual government[1]	Total		Research and development								R&D plant	
			Total		Basic		Applied		Development			
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
School districts	2,484	1,229	1,374	1,214	-	-	1,031	1,243	343	1,794	48	0
Edgewood, Tex. Ind. Sch. Dist.	-	417	-	417	-	-	-	-	-	417	-	-
Austin, Tex. Ind. Sch. Dist.	67	290	67	290	-	-	-	176	67	134	-	-
Pittsburg City, Okla Sch. Dist.	-	284	-	284	-	-	-	284	-	-	-	-
Tulsa City, Okla Sch. Dist.	91	243	89	243	-	-	89	243	-	-	3	-
Milwaukee City, Wis. Sch. Dist.	172	229	172	229	-	-	172	229	-	-	-	-
Broward Co., Fla. Bd. of Pub. Inst.	134	219	134	219	-	-	-	-	134	219	-	-
San Juan City, Calif. Unif. Sch. Dist.	217	197	217	193	-	-	217	193	-	-	11	4
Fresno (Calif.), Calif. Ind. Dist. 1	201	174	211	174	-	-	201	174	-	-	-	-
Clark Co., Nev. Sch. Dist.	177	161	177	161	-	-	177	144	-	41	-	-
Cincinnati City, Ohio Sch. Dist.	301	154	301	154	-	-	159	139	212	43	-	-
Tucson, Ariz. Sch. Dist. 1	75	122	73	122	-	-	75	72	-	50	-	-
Atlanta, Ga. Ind. Sch. Dist.	42	97	42	97	-	-	53	53	31	34	-	-
Fayette Co., Ky. Sch. Dist.	7	97	7	97	-	-	7	97	-	-	-	-
Dallas, Tex. Ind. Sch. Dist.	-	82	-	82	-	-	-	-	-	82	-	-
Boulder Valley, Colo. Sch. Dist. 2	-	69	-	69	-	-	-	69	-	-	-	-
Broward Co., Fla. Sch. Dist.	143	65	133	65	-	-	-	-	133	65	-	-
Baton Rouge, La. Sch. Dist.	72	62	72	62	-	-	32	34	41	28	-	-
Portland, Oreg. Sch. Dist. 1	-	51	-	51	-	-	-	37	-	-	-	14
Baltimore Co., Md. Sch. Dist.	-	51	-	51	-	-	-	51	-	-	-	0
Racine, Wis. Unif. Sch. Dist. 1	37	39	37	39	-	-	37	39	-	-	-	0
Dayton City, Ohio Sch. Dist.	21	21	21	21	-	-	21	21	-	-	-	-
Tuscaloosa, Calif. Unif. High Sch. Dist.	11	18	11	18	-	-	-	-	11	18	-	-
Palo Alto, Calif. Unif. Sch. Dist.	1	17	1	17	-	-	1	17	-	-	-	-
Little Rock, Ark. Sch. Dist.	8	15	8	15	-	-	8	15	-	-	-	-
Hayward, Calif. Unif. Sch. Dist.	45	14	45	14	-	-	-	-	45	14	-	-
Durham, Nasv. Public Schools	1	11	1	11	-	-	1	11	-	-	-	-
Santa Clara, Ca. Sch. Dist.	1	10	1	10	-	-	1	10	-	-	-	-
Wichita, Kans. Unif. Sch. Dist. 259	17	6	17	6	-	-	-	-	17	6	-	-
Piedmont, Calif. Unif. Sch. Dist.	4	5	4	5	-	-	-	-	4	5	-	-
Lincoln City, Nebr. Sch. Dist. 1	-	5	-	5	-	-	-	-	-	5	-	-
Topeka, Kans. Sch. Dist. 21	0	0	0	0	-	-	0	0	-	-	-	-
Santa Ana, Calif. Unif. Sch. Dist.	-	-	-	-	-	-	-	-	-	-	-	-
Stockton, Tex. Ind. Sch. Dist.	217	-	215	-	-	-	215	-	-	-	2	-
Fremont, Calif. Unif. Sch. Dist.	197	-	197	-	-	-	197	-	-	-	197	-
San Diego, Calif. Unif. Sch. Dist.	96	-	96	-	-	-	96	-	-	-	-	-
Counties	3,251	3,471	911	3,289	754	800	477	2,774	170	1,715	90	96
Dade Co., Fla. Comp. Govt.	92	1,796	92	1,796	92	1,796	-	-	-	-	-	-
Marion Co. Ind. Health and Hospital Corp.	178	854	178	854	178	854	827	748	0	53	-	-
Dallas Co., Tex. Commiss. Court	448	446	314	346	314	346	111	100	111	273	85	71
Cuyahoga Co., Ohio Comp. Govt.	0	97	0	97	97	97	-	-	-	-	-	-
Cook Co., Ill. Comp. Govt.	81	83	81	83	-	-	81	83	-	-	-	-
Jefferson, Calif. Comp. Govt.	-	-	-	-	-	-	-	-	-	-	-	-
Orange Co., Calif. Health Facil.	-	-	-	-	-	-	-	-	-	-	-	-
Palm Tm., Calif. Comp. Govt.	-	-	-	-	-	-	-	-	-	-	-	-
Marin Co., Calif. Comp. Govt.	24	-	24	-	-	-	24	-	-	-	-	-
Townships	108	111	108	111	-	-	108	111	-	-	-	-
Hempstead, N.Y.	847	847	847	847	-	-	847	847	-	-	-	-
Hempstead, N.Y.	91	91	91	91	-	-	-	91	-	91	-	-

1 Listed according to total research and development and R&D plant expenditures for fiscal year 1969.
2 Less than $500.

Table B-15. Local Government Expenditures for Research and Development, by Type of Local Government and Field of Science, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Clinical medical		Social sciences		Engineering		Environmental sciences	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	29,431	31,688	6,264	11,804	7,857	10,238	7,069	6,473	1,816	2,781
Multipurpose	15,104	20,963	3,895	7,437	2,910	4,148	4,232	5,919	653	1,147
Counties	7,365	9,073	3,463	3,741	2,491	3,207	737	475	352	722
Special districts	3,237	3,603	-	-	341	426	2,081	2,063	630	891
School districts	2,376	3,219	2	-	1,915	2,159	-	-	-	-
Hospital districts	918	2,424	904	2,424	13	-	-	-	-	-
Townships	431	407	-	24	186	298	19	15	13	35

Type of government	Psychology		Statistical		Mathematics		Physical sciences		Other sciences	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	758	1,961	1,727	1,019	1,220	1,273	73	113	758	1,471
Multipurpose	144	477	1,392	1,011	1,204	1,137	51	61	741	1,244
Counties	275	446	149	233	-	36	-	33	18	203
Special districts	-	-	143	234	-	-	22	17	-	1
School districts	439	1,038	-	-	-	-	-	1	-	23
Hospital districts	-	-	-	-	-	-	-	-	-	-
Townships	-	-	12	34	-	-	-	-	-	-

Table B-16. Local Government Expenditures for Basic Research, by Type of Local Government and Field of Science, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Clinical medical		Social sciences		Engineering		Environmental sciences	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	5,455	5,764	5,041	5,114	98	140	61	63	83	148
Multipurpose	3,363	3,999	3,170	3,859	52	94	13	23	4	23
Counties	2,039	2,436	1,855	2,404	24	38	-	-	24	28
Special districts	73	138	-	-	-	-	-	-	47	83
School districts	-	-	-	-	-	-	-	-	-	-
Hospital districts	954	924	954	924	-	-	-	-	-	-
Townships	9	-	-	-	-	-	-	-	-	-

Type of government	Psychology		Statistical		Mathematics		Physical sciences		Other sciences	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	33	7	1,147	1,288	177	217	7	7	7	9
Multipurpose	-	7	1,147	1,254	177	177	-	7	-	-
Counties	33	-	74	34	-	-	-	-	-	-
Special districts	-	-	26	26	-	-	-	-	-	9
School districts	-	-	-	-	-	-	-	-	-	-
Hospital districts	-	-	-	-	-	-	-	-	-	-
Townships	-	-	-	-	-	-	-	-	-	-

Table B-17. Local Government Expenditures for Applied Research, by Type of Local Government and Field of Science, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Clinical medical		Social sciences		Engineering		Environmental sciences	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	12,656	15,474	2,536	2,861	3,572	4,993	2,930	2,686	1,491	1,734
Municipalities	5,531	6,340	1,324	899	858	1,494	1,460	1,307	591	696
Counties	2,890	3,793	740	1,059	1,047	1,430	583	400	316	466
Special districts	1,914	2,102	-	-	309	394	875	964	571	557
School districts	1,631	2,045	2	-	1,175	1,468	-	-	-	-
Hospital districts	483	879	470	879	13	-	-	-	-	-
Townships	207	315	-	24	170	207	12	15	13	35

Type of government	Psychology		Biological		Mathematics		Physical sciences		Other sciences	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	726	1,190	569	445	-	141	72	109	757	1,296
Municipalities	144	470	366	203	-	141	70	58	739	1,771
Counties	138	160	49	38	-	-	-	33	18	203
Special districts	-	-	138	170	-	-	22	17	-	-
School districts	434	555	-	-	-	-	-	-	-	22
Hospital districts	-	-	-	-	-	-	-	-	-	-
Townships	-	-	12	34	-	-	-	-	-	-

Table B-18. Local Government Expenditures for Development, by Type of Local Government and Field of Science, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Clinical medical		Social sciences		Engineering		Environmental sciences	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	11,975	17,479	494	1,991	4,267	7,129	4,127	5,794	279	934
Municipalities	4,202	12,143	321	1,533	2,341	5,571	2,734	4,389	54	431
Counties	2,191	2,849	299	274	1,452	1,759	179	76	182	229
Special districts	1,252	1,352	-	-	33	59	1,074	1,131	14	261
School districts	760	1,174	-	-	760	691	-	-	-	-
Hospital districts	135	1,121	135	1,121	-	-	-	-	-	-
Townships	34	91	-	-	21	51	-	-	-	-

Type of government	Psychology		Biological		Mathematics		Physical sciences		Other sciences	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	23	794	4	34	644	444	2	2	2	174
Municipalities	-	-	-	4	644	434	2	2	2	174
Counties	23	185	4	12	-	10	-	-	-	-
Special districts	-	-	-	18	-	-	-	-	-	-
School districts	-	609	-	-	-	-	-	-	-	-
Hospital districts	-	-	-	-	-	-	-	-	-	-
Townships	-	-	-	-	-	-	-	-	-	-

Table B-19. Local Government Expenditures for Research and Development, by Type of Local Government and Performing Organization, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type of government	Total		Intramural		Universities and colleges[a]		Private individuals or firms		Private nonprofit organizations		Other[b]	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	29,431	39,688	20,551	28,168	1,396	1,400	5,504	5,453	875	3,351	1,104	1,316
Municipalities	15,104	20,963	9,914	13,560	883	862	2,882	3,152	804	2,659	622	729
Counties	7,565	9,073	6,581	7,799	109	93	636	780	-	78	239	323
Special districts	3,237	3,603	1,208	1,739	402	360	1,395	1,127	52	138	180	240
School districts	2,376	3,219	1,854	2,484	2	58	437	221	20	433	63	23
Hospital districts	918	2,424	918	2,382	-	-	-	-	-	42	-	-
Townships	231	407	76	205	1	28	154	173	-	-	-	-

[a] Includes both public and private institutions.
[b] Includes State government agencies and other governmental agencies, including Federal, agencies of other local governments, or multi-governmental agencies.

Table B-20. Fifty Local Governments Leading in Research and Development Expenditures, by Type and Individual Local Government, and Performing Organization, Fiscal Years 1968 and 1969

(Thousands of dollars)

Type and individual government[a]	Total		Intramural		Universities and colleges[b]		Private individuals or firms		Private nonprofit organizations		Other[c]	
	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
Total	29,431	39,688	20,551	28,168	1,396	1,400	5,504	5,453	875	3,351	1,104	1,316
Municipalities	15,104	20,963	9,914	13,560	883	862	2,882	3,152	804	2,659	622	729
New York City, N.Y.	4,671	5,450	2,537	2,313	-	-	1,948	1,281	96	1,763	90	93
Boston, Mass.	840	2,628	35	1,944	735	564	70	120	-	-	-	-
Philadelphia, Pa.	2,306	2,432	2,155	2,234	72	62	4	-	-	70	75	66
Los Angeles, Calif.	1,692	1,718	953	1,113	-	3	420	462	150	57	169	82
Baltimore, Md.	755	1,147	755	1,015	-	10	-	121	-	-	-	-
Chicago, Ill.	836	1,103	255	338	17	-	136	262	429	504	-	-
San Francisco, Calif.	371	648	266	388	-	-	105	260	-	-	-	-
Detroit, Mich.	323	518	323	518	-	-	-	-	-	-	-	-
San Jose, Calif.	124	512	121	482	-	-	4	18	(d)	12	-	-
Dist. of Columbia	825	476	792	442	-	-	33	33	-	-	-	-
Milwaukee, Wis.	326	465	120	140	-	-	-	-	-	-	206	325
Lansing, Mich.	222	428	172	211	5	7	12	157	-	-	33	52
Hartford, Conn.	361	422	361	417	-	-	-	5	-	-	-	-
Jacksonville, Fla.	251	417	205	233	-	-	-	98	45	78	-	7
Minneapolis, Minn.	261	386	244	376	-	-	18	11	-	-	-	-
Wichita Falls, Tex.	104	289	59	137	-	-	44	151	-	-	-	-
Duluth, Minn.	200	255	150	175	-	-	-	10	-	-	50	70
Seattle, Wash.	87	235	-	60	-	3	4	2	84	170	-	-
All other	549	1,435	411	1,022	54	212	85	161	-	5	-	34
Counties	7,565	9,073	6,581	7,799	109	93	636	780	-	78	239	323
Los Angeles Co., Calif.	1,754	2,400	1,499	2,247	-	-	212	153	-	-	42	-
Cook Co., Ill.	2,185	2,055	2,185	2,055	-	-	-	-	-	-	-	-
Nassau Co., N.Y.	695	853	548	716	16	-	71	77	-	-	60	60
Fairfax Co., Va.	696	691	696	688	-	-	-	3	-	-	-	-
Dade Co., Fla.	247	407	9	86	-	-	135	216	-	-	103	106
Hennepin Co., Minn.	-	403	-	248	-	-	-	26	-	-	-	128
Anne Arundel Co., Md.	344	265	162	145	-	4	142	110	-	6	-	-
Santa Clara Co., Calif.	236	242	122	128	89	89	-	-	-	-	25	25
Essex Co., N.J.	10	208	10	81	-	-	-	127	-	-	-	-
Wayne Co., Mich.	173	203	173	203	-	-	-	-	-	-	-	-
Montgomery Co., Md.	221	159	221	159	-	-	-	-	-	-	-	-
All other	1,004	1,188	957	1,044	4	-	35	67	-	73	9	4
Special districts	3,237	3,603	1,208	1,739	402	360	1,395	1,127	52	138	180	240
Chicago, Ill. Transist Auth.	337	801	282	371	-	-	24	376	31	54	-	-
Met. Sanitary Dist. of greater Chicago, Ill.	305	481	61	322	244	159	-	-	-	-	-	-
Allegheny Co., Pa. Port Auth.	866	318	23	15	64	-	780	303	-	-	-	-
Los Angeles Co., Calif. Sanitation Dist.	190	295	190	295	-	-	-	-	-	-	-	-
Met. Water Dist. of Southern Calif.	382	210	136	139	13	-	141	71	-	-	-	-
Alameda-Contra Costa, Calif. Transit Dist.	-	192	-	59	-	59	-	3	-	70	-	-
Minn.-St. Paul Sanitary Dist.	154	175	102	101	-	5	52	70	-	-	-	-
All other	1,071	1,131	414	437	79	136	378	304	21	14	180	240
School districts	2,376	3,219	1,854	2,484	2	58	437	221	20	433	63	23
Edgewood, Tex. Ind. Sch. Dist.	-	418	-	-	-	-	-	-	-	418	-	-
Austin, Tex. Ind. Sch. Dist.	47	290	36	259	-	-	12	31	-	-	-	-
Columbus City, Ohio Sch. Dist.	-	264	-	264	-	-	-	-	-	-	-	-
Toledo City, Ohio Sch. Dist.	69	243	72	196	2	7	14	39	(d)	(d)	-	-
Milwaukee City, Wis. Sch. Dist.	172	228	172	186	-	42	-	-	-	-	-	-
Broward Co., Fla. Bd. of Pb. Inst.	134	208	134	208	-	-	-	-	-	-	-	-
Denver City-Co., Colo. Sch. Dist. 1	261	196	261	196	-	-	-	-	-	-	-	-
San Jose City, Calif. Unif. Sch. Dist.	208	183	137	134	-	-	54	32	14	13	-	-
Clark Co., Nev. Sch. Dist.	137	184	137	184	-	-	-	-	-	-	-	-
Cleveland City, Ohio Sch. Dist.	321	184	161	175	-	-	159	9	-	-	-	-
All other	1,029	911	744	763	-	9	168	90	6	-	63	23
Hospital districts and authorities	1,149	2,831	994	2,587	1	28	134	173	-	42	-	-
Bexar Co., Tex. Hosp. Dist.	74	1,784	74	1,702	-	-	-	-	-	42	-	-
Harris Co., Ind. Health and Hosp. Corp.	434	861	434	861	-	-	-	-	-	-	-	-
Dallas Co., Tex. Hosp. Dist.	203	189	203	189	-	-	-	-	-	-	-	-
Hampstead Cap., N.Y.	403	317	43	133	1	21	134	173	-	-	-	-
All other	35	140	40	102	-	7	-	-	-	-	-	-

[a] Listed according to total R&D expenditures for fiscal year 1969.
[b] Includes both public and private institutions.
[c] Includes State government agencies and other governmental agencies, including Federal, agencies of other local governments, or multi-government agencies.
[d] Less than $500.

Table B-21. Full-Time Equivalent Number of Personnel Engaged in Research and Development in Local Governments, by Type of Local Government, Fiscal Years 1968 and 1969

Type of government	Total		Scientists and engineers		Technicians		Others[a]	
	1968	1969	1968	1969	1968	1969	1968	1969
Total	1,874.5	2,629.2	836.1	1,051.9	543.1	778.9	495.2	798.4
Municipalities	980.2	1,307.0	433.2	495.0	270.3	382.0	276.7	430.0
Counties	512.4	662.2	208.5	262.5	177.4	236.0	126.5	163.7
Special districts	102.3	145.4	40.9	53.4	45.4	59.3	16.0	32.7
School districts	173.5	238.5	107.1	129.3	17.6	16.6	48.8	92.6
Hospital districts	98.1	255.2	43.9	105.4	29.4	79.4	24.8	70.4
Townships	8.0	20.9	2.5	6.3	3.0	5.6	2.5	9.0

[a] Includes typists, clerks, and administrative personnel.

Table B-22. Local Government Expenditures for Research, Development, and R&D Plant, by Type of Local Government and Character of Work, Fiscal Years 1966-1969

(Thousands of dollars)

Type of government	Total				Research and development							
					Total				Basic			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	21,163	31,673	31,455	46,840	20,344	28,844	29,431	39,688	7,872	9,212	6,400	6,742
Municipalities	11,723	18,767	16,077	26,477	11,474	17,533	15,104	25,963	5,846	7,058	3,363	3,577
Counties	5,976	9,030	7,769	10,043	5,973	7,858	7,565	9,073	1,505	1,884	2,655	2,632
Special districts	1,619	1,315	3,937	4,207	1,534	1,004	3,237	3,603	16	21	71	108
School districts	1,155	1,771	2,424	3,228	1,124	1,733	2,376	3,219	-	-	-	-
Hospital districts	631	581	1,011	2,475	580	508	918	2,424	504	229	304	424
Townships	59	208	238	410	59	208	231	407	-	20	7	-

Type of government	Research and development								R&D plant			
	Applied				Development							
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	7,731	11,264	12,656	15,476	4,772	5,369	10,375	17,473	819	2,829	2,025	5,151
Municipalities	4,553	6,526	5,531	6,340	1,775	3,969	6,211	11,363	249	1,234	972	3,514
Counties	2,333	3,150	2,890	3,793	1,791	2,024	2,020	2,443	403	1,179	234	970
Special districts	272	582	1,914	2,102	1,345	421	1,252	1,503	89	311	721	634
School districts	427	619	1,431	2,345	718	1,121	745	1,174	31	37	48	9
Hospital districts	76	198	463	879	-	71	131	1,121	51	54	50	51
Townships	59	189	207	321	-	-	16	91	-	[a]	7	1

[a] Less than $500.

Table B-23. Local Government Expenditures for Research and Development, by Type of Local Government and Functional Area, Fiscal Years 1966-1969

(Thousands of dollars)

Type of government	Total				Health and hospitals				Education			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	20,344	28,844	29,431	39,688	11,271	14,512	10,725	15,506	2,034	3,237	4,455	5,042
Municipalities	11,474	17,533	15,104	20,963	7,595	9,879	5,394	7,775	508	770	947	781
Counties	5,573	7,858	7,565	9,073	3,078	4,107	4,259	5,108	401	733	1,131	1,043
Special districts	1,534	1,004	3,237	3,603	18	18	154	175	-	-	-	-
School districts	1,124	1,733	2,376	3,219	-	-	-	-	1,124	1,733	2,376	3,219
Hospital districts	580	508	918	2,424	580	508	918	2,424	-	-	-	-
Townships	59	208	231	407	-	-	-	24	-	-	-	-

	Sanitation				Police and corrections				Municipal utilities			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	721	1,303	1,999	4,802	620	1,681	4,163	4,408	720	1,220	3,695	3,394
Municipalities	619	1,008	902	3,579	229	1,000	3,506	3,261	608	1,088	1,175	1,089
Counties	93	182	457	295	392	681	645	942	104	107	288	372
Special districts	9	113	640	928	-	-	-	192	7	25	2,098	1,846
School districts	-	-	-	-	-	-	-	-	-	-	-	-
Hospital districts	-	-	-	-	-	-	-	-	-	-	-	-
Townships	-	-	-	-	-	-	12	12	-	-	134	88

	Financial administration and general control				Housing and urban renewal				Natural resources			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	1,764	2,613	1,880	2,619	427	1,455	472	1,738	1,646	1,170	814	707
Municipalties	1,255	1,891	1,496	2,050	427	1,430	357	1,122	-	(a)	505	263
Counties	450	632	277	476	-	-	78	456	190	473	112	150
Special districts	-	-	108	93	-	-	-	42	1,457	603	156	196
School districts	-	-	-	-	-	-	-	-	-	-	-	-
Hospital districts	-	-	-	-	-	-	-	-	-	-	-	-
Townships	59	90	-	-	-	25	37	119	-	93	41	98

	Highways				Public welfare				Other			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	52	57	47	120	820	1,030	83	73	270	568	1,196	1,280
Municipalities	-	-	40	116	34	232	-	-	179	235	782	927
Counties	52	57	-	-	784	798	83	73	48	88	230	160
Special districts	-	-	-	-	-	-	-	-	43	245	81	131
School districts	-	-	-	-	-	-	-	-	-	-	-	-
Hospital districts	-	-	-	-	-	-	-	-	-	-	-	-
Townships	-	-	7	3	-	-	-	-	-	-	-	62

(a) Less than $500,000.

Table B-24. Local Government Expenditures for Research and Development, by Type of Local Government and Source of Funds, Fiscal Years 1966-1969

(Thousands of dollars)

Type of government	Total				Local governments				State government			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	20,344	28,844	29,431	39,688	7,303	10,097	12,013	15,925	715	1,113	1,249	4,265
Municipalities	11,474	17,533	15,104	20,963	3,478	5,977	6,174	8,182	215	374	322	2,323
Counties	5,573	7,858	7,565	9,073	1,852	2,602	3,440	4,483	258	474	238	776
Special districts	1,534	1,004	3,237	3,603	1,409	634	1,719	1,933	-	67	429	146
School districts	1,124	1,733	2,376	3,219	521	688	301	660	242	198	230	268
Hospital districts	580	508	918	2,424	-	25	293	527	-	-	31	746
Townships	59	208	231	407	43	171	86	140	-	-	-	7

	Federal Government				Other[a]			
	1966	1967	1968	1969	1966	1967	1968	1969
Total	11,117	16,091	15,482	18,377	1,209	1,542	687	1,122
Municipalities	7,141	10,230	8,094	9,641	641	951	514	816
Counties	3,058	4,307	3,837	3,712	405	474	51	103
Special districts	125	303	1,041	1,442	-	-	47	82
School districts	198	732	1,845	2,275	163	117	1	16
Hospital districts	580	482	526	1,057	-	-	68	94
Townships	16	37	139	250	-	-	6	11

[a] Includes only grants, reimbursements, or cost-sharing amounts provided by foundations, business firms, universities and colleges, or other outside sources.

Table B-25. Local Government Expenditures for Research and Development, by Type of Local Government and Field of Science, Fiscal Years 1966-1969

Type of government	Total				Clinical medical				Social sciences				Engineering				Environmental sciences			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	20,364	24,844	29,431	39,687	10,134	12,843	8,264	11,806	4,831	8,576	7,857	10,238	3,096	3,989	7,069	8,473	665	1,083	1,808	2,785
Municipalities	11,474	13,833	15,304	20,963	7,146	9,130	3,895	5,617	2,049	4,181	2,910	4,148	1,296	2,579	4,212	5,919	404	638	653	1,147
Counties	5,373	5,858	7,561	9,073	2,408	3,206	3,463	3,741	1,940	2,705	2,491	3,207	373	613	757	475	231	340	512	722
Special districts	1,136	1,354	3,237	3,669	-	-	-	-	43	71	341	426	1,427	797	2,081	2,063	30	59	630	881
School districts	1,324	1,733	2,315	3,219	-	-	2	-	740	1,504	1,915	2,159	-	-	-	-	-	-	-	-
Hospital districts	185	318	914	2,424	580	507	904	2,424	-	-	13	-	-	(a)	-	-	-	-	-	-
Townships	14	208	231	487	-	-	-	24	59	115	186	298	-	-	19	15	-	46	13	35

Type of government	Psychology				Biological				Mathematics				Physical sciences				Other			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	703	1,021	778	1,961	430	913	1,717	1,669	-	45	1,106	1,173	67	78	73	113	220	298	758	1,471
Municipalities	203	528	244	479	200	217	1,392	1,211	-	45	1,106	1,137	47	58	51	61	-	117	741	1,246
Counties	227	351	171	446	333	578	149	210	-	-	-	36	14	14	-	33	47	54	18	203
Special districts	-	-	-	-	27	71	163	214	-	-	-	-	6	6	22	17	-	-	-	1
School districts	272	103	479	1,036	-	-	-	-	-	-	-	-	-	-	-	1	173	127	-	22
Hospital districts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Townships	-	-	-	-	-	47	12	34	-	-	-	-	-	-	-	-	-	-	-	-

(a) Less than $500.

Table B-26. Local Government Expenditures for Research and Development, by Type of Local Government and Performing Organization, Fiscal Years 1966-1969

Type of government	Total				Intramural				Universities and colleges[a]			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	20,344	28,844	29,431	39,688	16,268	23,615	20,551	28,168	1,184	838	1,396	1,400
Municipalities	11,474	17,533	15,104	20,963	9,135	13,736	9,914	13,560	381	611	883	862
Counties	5,573	7,858	7,565	9,073	5,289	7,070	6,581	7,799	34	115	109	93
Special districts	1,534	1,004	3,237	3,603	352	638	1,208	1,739	747	66	402	360
School districts	1,124	1,733	2,376	3,219	903	1,538	1,854	2,484	8	8	2	58
Hospital districts	580	508	918	2,424	566	493	918	2,382	14	14	-	-
Townships	59	208	231	407	24	139	76	205	-	25	1	28

Type of government	Private individuals or firms				Private nonprofit organizations				Other[b]			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Total	1,337	2,087	5,504	5,453	1,126	1,455	875	3,351	431	848	1,104	1,316
Municipalities	553	1,342	2,882	3,152	1,103	1,301	804	2,659	302	542	622	729
Counties	205	438	636	780	9	28	-	78	36	208	239	323
Special districts	435	178	1,395	1,127	-	93	52	138	-	28	180	240
School districts	108	86	437	221	14	33	20	433	92	69	63	23
Hospital districts	-	-	-	-	-	-	-	42	-	-	-	-
Townships	35	44	154	173	-	-	-	-	-	-	-	-

[a] Includes both public and private institutions.
[b] Includes State government agencies and other governmental agencies, including Federal, agencies of other local governments, or multi-governmental agencies.

APPENDIX C

R. & D. Activities of Universities and Colleges Controlled by Local Governments, 1968

	Page
TABLE C–1. R. & D. expenditures of universities and colleges controlled by local governments, by State and character of work, fiscal year 1968	48
TABLE C–2. R. & D. expenditures of universities and colleges controlled by local governments, by State and source of funds, fiscal year 1968	48
TABLE C–3. Research expenditures of universities and colleges controlled by local governments, by State and field of science, fiscal year 1968	49

Although there were over 300 institutions of higher education classified as being controlled by local governments in 1968, only 26 reported expenditures for research and development of over $50,000. Total R. & D. expenditures were $28 million in 1968, more than double the total of 1966. However, about one-half of the increase was due to one institution which was classified as being controlled by local governments in 1968 but was not in 1966. An important point is that most of these locally controlled institutions are junior colleges and community colleges and only a few are 4-year schools or higher.

The data in this summary were derived from the 1968 Survey of Scientific Activities of Institutions of Higher Education conducted by the National Science Foundation. All institutions of higher education are covered (public and private). The data on local government R. & D. activities included R. & D. work contracted out to universities and colleges as well as other performers. There is, therefore, a small overlap between the two surveys. The overlap was about $700,000 in 1968 and represents the funds provided to local universities and colleges by local governments for R. & D. purposes which was reported in both surveys. The size of the overlap is statistically insignificant in both reports.

Over two-thirds of the total R. & D. expenditures of these local institutions of higher education represented activity by three schools—the University of Louisville, the City University of New York System, and the University of Cincinnati. All three of these universities have medical schools which account for most of the R. & D. activity conducted.

Like the funding of local government R. & D. activity, a large share of the total funds of local universities and colleges came from the Federal Government—68 percent. The next largest source was the institutions' own funds which accounted for 10 percent. Local and State governments furnished very little—less than 3 percent each.

Basic research is the predominant activity at local universities and colleges overall, 67 percent. Applied research work represented 28 percent of the total and development 5 percent. As could be expected, since a large part of the R. & D. activity of local universities and colleges is in the medical schools, the life sciences received most of the emphasis and accounted for 67 percent of the total research expenditures (development not classified by field of science). The engineering sciences were the next major area with about 10 percent of the total. The field of science pattern in universities and colleges is similar to that of local governments which also concentrate on health and hospital R. & D. work although not devoting the same emphasis to the basic research aspects.

TABLE C–1. *R. & D. expenditures of universities and colleges controlled by local governments, by State and character of work, fiscal year 1968*

[Dollars in thousands]

State	Total	Research and development		
		Basic research	Applied research	Development
United States, total	$28,314	$19,003	$7,971	$1,340
California	203	48	120	35
Illinois	210	50	124	36
Kentucky	2,629	2,498	131	.....
Maryland	148	35	88	25
Michigan	347	82	205	59
Mississippi	245	58	145	42
Missouri	104	52	52	.....
New Jersey	239	239	.....	.....
New York	14,201	11,814	1,807	579
North Carolina	96	23	57	16
Ohio	8,640	3,805	4,501	334
Oregon	163	39	96	28
Tennessee	56	13	33	10
All other	1,03	246	612	176

NOTE.—Detail may not add to total because of rounding.

TABLE C–2. *R. & D. expenditures of universities and colleges controlled by local governments, by State and source of funds fiscal year 1968*

[Dollars in thousands]

State	Total R. & D.	Local government	State government	Federal Government	Foundations	Voluntary health agencies	Industry	Institution's own funds	Other
United States, total	$28,314	$641	$696	$19,119	$1,692	$405	$1,532	$2,895	$1,263
California	203	.....	3	153	25	.....	.....	18	.....
Illinois	210	.....	5	150	26	.....	1	19	1
Kentucky	2,629	.....	15	2,171	3	137	57	.....	246
Maryland	148	.....	4	111	19	.....	1	13	.....
Michigan	347	1	7	281	34	.....	0	24	1
Mississippi	245	.....	6	194	31	.....	1	22	1
Missouri	104	.....	.....	.....	104	.....	.....	.....	.....
New Jersey	239	.....	.....	66	35	.....	8	130	.....
New York	14,201	639	597	9,750	651	170	140	1,826	230
North Carolina	96	.....	2	72	12	1	.....	9	.....
Ohio	8,640	1	13	5,312	339	187	1,314	695	739
Oregon	163	.....	4	123	20	.....	1	14	1
Tennessee	56	.....	1	42	7	.....	.....	3	.....
All other	1,033	.....	37	696	166	.....	8	120	4

NOTE.—Detail may not add to total because of rounding.

TABLE C–3. *Research expenditures* [1] *of universities and colleges controlled by local governments, by State and field of science, fiscal year 1968*

[Dollars in thousands]

State	Total research	Engineering	Life sciences	Environmental sciences	Physical sciences	Mathematics	Psychological sciences	Social sciences	Other
United States, total	$26,973	$2,647	$18,176	$1,383	$1,466	$136	$1,571	$773	$821
California	168	15	22	71	17	5	17	8	13
Illinois	174	16	22	73	18	5	17	9	13
Kentucky	2,629	6	2,105	.....	194	2	284	38	.....
Maryland	123	11	16	52	13	4	12	6	9
Michigan	287	27	37	121	30	8	29	15	21
Mississippi	203	19	26	86	21	6	20	11	15
Missouri	104	.....	66	.....	.....	.....	.....	.....	38
New Jersey	239	178	.....	.....	61	.....	.....	.....	.....
New York	13,621	500	10,572	326	674	60	851	487	152
North Carolina	80	7	10	34	8	2	8	4	6
Ohio	8,306	1,770	5,166	183	320	12	231	144	480
Oregon	135	13	17	57	14	4	13	7	10
Tennessee	46	4	6	19	5	1	5	2	3
All other	858	81	111	361	91	27	84	42	61

[1] Excludes expenditures for development which were not classified by field of science. NOTE.—Detail may not add to total because of rounding.

APPENDIX D

Survey Questionnaire

Budget Bureau No. 41-S69107: Approval Expires November 30, 1970

Data supplied by	FORM S-103 (1-8-70) — U.S. DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS
Name	**SURVEY OF LOCAL GOVERNMENT RESEARCH AND DEVELOPMENT**
Title	
Agency	
Address	
Telephone *(Area code, number, extension)*	**TO: Bureau of the Census, Governments Division, Washington, D.C. 20233**

DEFINITIONS AND REPORTING INSTRUCTIONS

Please read through this entire questionnaire before filling it out. Then, as promptly as possible, assemble and enter the requested information and return the original copy in the accompanying official envelope. No postage is needed. The file copy is for your records.

A. This survey will cover the R&D activities of local governments, but local governmental institutions of higher education and their affiliated organizations, such as research centers, or agricultural experiment stations, are **not** included. These are covered in other surveys. When reference is made in the questionnaire to State government agencies, these also exclude State universities and colleges and their affiliated organizations.

B. The term "research and development (R&D) activities" as used in this survey covers:

1. Research, that is, systematic, intensive study directed toward fuller scientific knowledge or understanding of the subject studied. Research may be classified as either basic or applied. In **basic research** the investigator is concerned primarily with gaining a fuller knowledge or understanding of the subject under study. In **applied research** the investigator is primarily interested in a practical use of the knowledge or understanding for the purpose of meeting a recognized need.

2. Development, that is, the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes. It represents the application of the findings of research to meet practical problems.

3. R&D plant, that is, facilities and fixed equipment used in support of research and development. Included is the acquisition of, construction of, major repairs to, or alterations in structures, works, equipment, facilities, or land, for use in the performance of research and development. Excluded from the R&D plant category are expendable equipment and miscellaneous items such as office furniture and supplies.

NOTE: EXCLUDED from research and development are the adoption of new techniques and products, collection of general purpose statistics, routine product testing, quality control, mapping and surveys, and activities concerned primarily with the dissemination of scientific information and the training of scientific manpower.

The adoption of new techniques, products, or processes which have already been brought to a usable condition is excluded from research and development as is the modification of existing technology, methods, or processes that does not result in significant new knowledge or new approaches. For example, if one local government agency performs research on polluted water and subsequently develops a new method of treating such water to make it potable, the activity would be classified as research and development. However, the adoption of this new method by another local government agency would not be classified as research and development.

Also excluded from research and development as noted above, is the collection of general-purpose statistics. It is important to distinguish between the gathering of information which is an integral part of research and development and the collection of general-purpose statistics or facts on a particular population or activity, which is undertaken either for the internal operational use of an agency or for informing the general public. Such fact or information gathering should not be reported as research and development because it is not part of an organized effort to make a basic contribution to knowledge in a field of science or to develop a new product or process.

To illustrate, a municipal health department normally gathers and publishes, on a regular basis, statistics on the incidence of various diseases within the city. In itself, this activity is general-purpose data collection because the data gathering is not part of a research program and because the data are designed for use by a range of persons such as practicing physicians, public health officers, and school officials. If the data on incidence of disease were gathered as part of a project on the origin and nature of particular diseases, or to establish some generalization on why certain individuals or groups contact certain diseases, this would be research. Similarly, in the area of welfare, the collection of statistics on number and class of welfare recipients would not in itself be considered research. But, if the collection were part of a research study of types of individuals who are on welfare and their problems, or part of an experiment in new ways of getting people off welfare, it would be research. One more example of research might be investigations of a local Department of Correction into the causes of crime, types of persons involved, why and how people become criminals, and methods or experiments in rehabilitation. Collection of statistics on the crime rate would be simple data collection.

C. Your report should cover all R&D work conducted directly or financed on a contractual basis during fiscal years 1968 and 1969 by your agency, but should **exclude** any services provided by you for R&D projects financed by other local governments. R&D projects which were partially or fully financed by organizations **other** than other local governments (such as the Federal or State governments) are to be **included.**

D. If all your research and development work involves only one type of activity (as described in instruction 3, below), and only one field of science (as described in instruction 5, below), please report in terms of one single comprehensive project. Otherwise, use successive sets of columns to report as separate projects those activities which differ from one another in either of these aspects.

Following are instructions which apply to reporting for each "project," as defined above.

Item 1 – List the name of the agency or subdivision of your government involved in each R&D project reported.

Item 2 – Please enter a brief description, in nontechnical terms, of the project and its primary applications or objectives.

Item 3 – Check each project according to the type of R&D work involved – basic research, applied research, or development – as defined in paragraph B above. If the work involved more than one of these types, please report for each as an individual project.

Item 4 – Check each project as to whether the type of R&D work involved is medical and health-related. Because medical and health-related research comprises a broad area of scientific inquiry aimed ultimately at the improvement of human health and the conquest of disease, it draws upon all fields of science – life, physical, engineering, psychological, and social – and many disciplines within each field. Within this broader context medical and health-related research is defined as all systematic study directed toward the development and use of scientific knowledge through fundamental research in the laboratory, clinical investigations, clinical trials, epidemiological, engineering and demographic studies, and controlled pilot projects in the following areas:

a. The causes, diagnosis, treatment, control, prevention of, and rehabilitation relating to, the physical and mental diseases and other killing and crippling impairments of mankind;

b. The origin, nature, and solution of health problems not identifiable in terms of disease entities, such as – research in problems of mental health and human development; alcoholism, drug addiction, sexual deviancy; accident prevention; air and water pollution.

c. Broad fields of science where the research is undertaken to obtain an understanding of processes affecting disease and human well being;

d. Research in nutritional and population problems impairing, contributing to or otherwise affecting optimum health;

e. Development of improved methods, techniques, and equipment for research, diagnosis, therapy, rehabilitation and promotion of public health;

f. Research concerning all aspects of the organization and delivery of health services.

DEFINITIONS AND REPORTING

Item 5 – Check the field of science to which the project is applicable. Definitions of these fields are listed on page 3 of this form. If the project involved more than one field of science, please report separately. If this is not possible, please check the predominant field covered. In all cases, the field of science reported should be according to the nature of the project, and not by the type of personnel involved.

Item 6 – Report current expenditures for each project, i.e., all expenditures (including related overhead costs) other than those for R&D plant, which are to be reported at item 8. Current expenditures of your agency which apply to two or more projects should be allocated as accurately as possible among them. In the subsections of item 6, distribute expenditure amounts among the several categories provided, in terms of the type of government agency or other organization actually performing the R&D work. Please enter "None" or a dash for inapplicable items.

Item 7 – Determine the amount of total current expenditures for this R&D project (item 6d) financed from Federal Government sources, "specifically dedicated sources" (amounts provided by foundations, business firms, universities and colleges, or others specifically for the project being reported), State government sources, or own local government sources (funds of your own agency). Note that State and local sources do not include funds furnished by universities and colleges and that Federal sources include funds from Federal agencies administered by State agencies as well as Federal funds administered and expended directly by your own local agency. List the source amounts in the appropriate column for fiscal years 1968 and 1969; the total of 7a + 7b + 7c + 7d should be the same as item 6d. Please describe the Federal Government source in item 11 and name the "specifically dedicated source" in the Notes section.

Item 8 – Report for each project the total expenditures for R&D plant and facilities – including acquisition of land, structures and fixed equipment, and any construction, major repairs and alterations of plant used for R&D activities.

Item 9 – Determine the amount of total R&D plant expenditures (item 8) financed from Federal, State, or own local government sources and "other specifically dedicated sources" for both fiscal years 1968 and 1969 and list under the appropriate column. Definitions are the same as for item 7.

Item	R&D project or activity number 1	
1. Name of agency or subdivision involved – *See instruction 1*		
2. Nature of project – *Enter brief description: if additional space is needed, continue in "Notes" section. See instruction 2*		
3. Type of research or development work – *Check one for each project. See instruction 3*	☐ Basic research ☐ Applied research ☐ Development	
4. Is this project medical and health related? *See instruction 4*	☐ Yes	☐ No
5. Field of science *Check one for each project* *See instruction 5*	☐ Biological ☐ Clinical Medical ☐ Psychology ☐ Physical Sciences ☐ Environmental Sciences	☐ Mathematics ☐ Engineering ☐ Social Sciences ☐ Other Sciences *(Specify)* ____
6. R&D expenditures (excluding R&D plant) from all sources – *See instruction 6*	**Fiscal year 1968**	**Fiscal year 1969**
a. All R&D work performed directly by personnel of your agency except where funds expended are provided by other local governments		
b. R&D work performed for your agency through grants or reimbursements to universities and colleges (public and private), and their affiliated hospitals, agricultural experiment stations, or research centers:		
(1) State universities and colleges		
(2) Local public universities and colleges		
(3) Private universities and colleges		
c. Other R&D work of your agency contracted out to:		
(1) Private individuals or firms		
(2) Private nonprofit organizations		
(3) Other agencies of your local government		
(4) State government agencies		
(5) Other governmental agencies including federal, agencies of other local governments, or multigovernmental agencies		
d. Total R&D expenditures (a + b + c) Includes amounts financed from your own local government sources in addition to amounts called for under item 7 below		
7. Amount of total R&D expenditures (item 6d which excludes R&D plant) financed from: *See instruction 7*		
a. Federal Government sources – *Describe in detail at item 11*		
b. State government sources		
c. Local government sources (including your agency's own funds)		
d. Other specifically dedicated sources – *Explain in "Notes" section*		
8. Expenditures for R&D plant – *See instruction 8*		
9. Amount of total R&D plant expenditure (item 8) financed from: *See instruction 9*		
a. Federal Government sources – *Describe in detail at item 11*		
b. State government sources		
c. Local government sources (including your agency's own funds)		
d. Other specifically dedicated sources – *Explain in "Notes" section*		
10. Man-years of R&D employment in this government (or agency) – *See instruction 10*		
a. Scientists and engineers		
b. Technicians		
c. Other personnel		
d. Total (a + b + c)		

FORM S-103 (1-8-70)

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INSTRUCTIONS – Continued

Item 10 – Report man-years (to the nearest tenth of a 12-month year) applied on the project by your own employees. Note that the expenditures reported at item 6a included personnel costs of all man-years reported at item 10. For employees who worked part-time or on more than one project, please allocate man-years applicable for each project (not number of employees). For example, two employees, each working half a year (6 months) on an R&D project, would be considered to be the equivalent of 1.0 man-year. Do not include data here on personnel involving expenditures reported at items 6b and 6c.

Scientists and engineers include persons engaged in scientific work, and having at least a bachelor's degree or equivalent work experience in the appropriate field.

Technicians include persons engaged in scientific or engineering work, and having the technical knowledge equivalent to at least 2 years of training in the appropriate field beyond the high school level.

Other personnel includes typists, clerks, administrative and all other personnel allocable to the project.

Item 11 – Supplemental details are being requested concerning the Federal sources of funds.

Please report each project as fully as practicable, using estimates where necessary. If some items or subsections do not apply to a project, do not merely leave them blank, but enter "None" or a dash in the reporting space provided.

The "Notes" space, following the definitions of fields of science on page 3, may be used to explain any item that may be unclear, or to describe any other special facts about a reported project.

Please review your entries before signing and returning the original of the completed form in the accompanying envelope.

R&D project or activity number 2	R&D project or activity number 3	R&D project or activity number 4
☐ Basic research ☐ Applied research ☐ Development	☐ Basic research ☐ Applied research ☐ Development	☐ Basic research ☐ Applied research ☐ Development
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
☐ Biological ☐ Clinical Medical ☐ Psychology ☐ Physical Sciences ☐ Environmental Sciences ☐ Mathematics ☐ Engineering ☐ Social Sciences ☐ Other Sciences (Specify) ———	☐ Biological ☐ Clinical Medical ☐ Psychology ☐ Physical Sciences ☐ Environmental Sciences ☐ Mathematics ☐ Engineering ☐ Social Sciences ☐ Other Sciences (Specify) ———	☐ Biological ☐ Clinical Medical ☐ Psychology ☐ Physical Sciences ☐ Environmental Sciences ☐ Mathematics ☐ Engineering ☐ Social Sciences ☐ Other Sciences (Specify ———
Fiscal year 1968 / Fiscal year 1969	Fiscal year 1968 / Fiscal year 1969	Fiscal year 1968 / Fiscal year 1969

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11. Federal Source of Funds – List each supporting Federal agency and the amount of funds provided by each that are included under item 7a. Also please cite the Federal project or grant number and the enabling legislation (The Act of Congress) under which the reported funds have been authorized.

R&D Project or Activity No.	Name of Federal agency		Amount		Federal agency project/grant number	Congressional Act
	FY 1968	FY 1969	FY 1968	FY 1969		

NOTE: Please augment the description of your current projects (requested in item 2 of the questionnaire) by furnishing, if readily available, publications and other written material that will amplify the nature of the undertaking.

DEFINITIONS OF FIELDS OF SCIENCE

1. **Biological sciences** are those which, apart from the clinical medical sciences as defined below, deal with the origin, development, structure, function, and interaction of living things. The agricultural and basic medical sciences are included. Examples of biological sciences are:

   anatomy; animal sciences; bacteriology; biochemistry; biogeography; biological oceanography; biophysics; ecology; embryology; entomology; evolutionary biology; genetics; immunology; microbiology; nutrition and metabolism; parasitology; pathology; pharmacology; physical anthropology; physiology; plant sciences; radiobiology; systematics.

2. **Clinical medical sciences** are concerned with the use of scientific knowledge for the identification, treatment, and cure of disease. Examples of clinical medical sciences are:

   internal medicine; neurology; ophthalmology; preventive medicine and public health; psychiatry; radiology; surgery; veterinary medicine; dentistry; physical medicine and rehabilitation; pharmacy; podiatry.

3. **Psychology** deals with behavior, mental processes and individual and group characteristics and abilities. Examples of psychological sciences are:

   experimental psychology; animal behavior; clinical psychology; comparative psychology; ethnology; social psychology; educational, personnel, vocational psychology and testing; industrial and engineering psychology; development and personality.

4. **Physical sciences** are concerned with the understanding of the material universe and its phenomena. They comprise the fields of astronomy, chemistry, and physics.

5. **Environmental sciences** (terrestrial and extraterrestrial) are concerned with the gross non-biological properties of the areas of the solar system which directly or indirectly affect man's survival and welfare; they comprise the fields of atmospheric sciences, geological sciences, and oceanography. Obligations for oceanography are confined to studies supporting physical oceanography. Studies pertaining to life in the sea, or other bodies of water, are to be reported as support of biology.

6. **Mathematics** employs logical reasoning with the aid of symbols and is concerned with the development of methods of operation employing such symbols. Examples of mathematical disciplines are:

   algebra; analysis; applied mathematics; computer science; foundations and logic; geometry; numerical analysis; statistics; topology.

7. **Engineering** is concerned with studies directed toward developing engineering principles or toward making specific principles usable in engineering practice. Engineering is divided into seven fields: aeronautical, chemical, civil, electrical, mechanical, metallurgy and materials.

8. **Social sciences** are directed toward an understanding of the behavior of social institutions and groups and of individuals as members of a group. These include anthropology, economics, history, linguistics, political science, sociology, etc.

9. **Other sciences** not elsewhere classified. To be used for multidisciplinary and interdisciplinary projects that cannot be classified within one of the above broad fields of science.

Notes *(Please indicate item number and letter to which explanation applies)*

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